INTERNATIONAL PROJECTIONIST

MARCH 1953

VOLUME 28 • NUMBER 3

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At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee, and face the life-saving facts about cancer as presented in our new film "Man Alive!". You'll learn, too, that cancer is not unlike serious engine trouble—it usually gives you a warning:

(1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.
While these may not *always* mean cancer, any one of them should mean a visit to your doctor.
Most cancers are curable but *only* if treated in time!

You and Ed will also learn that until science finds a cure for *all* cancers your best "insurance" is a thorough health examination every year, no matter how well you may feel—twice a year if you are a man over 45 or a woman over 35.

For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society

MAN ALIVE! is the story of Ed Parmalee, whose fear weakens his judgment. He uses denial, sarcasm and anger in a delightful fashion to avoid having his car properly serviced and to avoid going to a doctor to have a symptom checked that may mean cancer. He finally learns what a difference it makes (in his peace of mind and in his disposition) to know how he can best guard himself and his family against death from cancer.

INTERNATIONAL PROJECTIONIST

With Which Is Combined PROJECTION ENGINEERING

JAMES J. FINN, *Editor*

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Published Monthly by

INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

19 West 44 Street, New York 36, N. Y.

Telephone: MUrray Hill 2-2948

R. A. ENTRACHT, Publisher

SUBSCRIPTION REPRESENTATIVES

AUSTRALIA: McGills, 183 Elizabeth St., Melbourne

NEW ZEALAND: Te Aro Book Depot, Ltd., 64 Courtenay Place, Wellington

ENGLAND and ELSEWHERE: Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2

YEARLY SUBSCRIPTION: United States and possessions, $2.50 (two years, $4); Canada and foreign countries, $3; single copies, 30 cents. Changes of address should be submitted two weeks in advance of publication date to insure receipt of current issue. Entered as second class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879.

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MONTHLY CHAT

IT IS neither the function nor the intent of IP to decry any process which promises a significant assist to the technical or economic health of the motion picture industry, but recent developments in the production and exhibition branches of the business have convinced IP that the time has come for sane thinking and plain speaking.

Technology, which provided the lifeblood for a fabulous industry, has taken over the conduct of the motion picture business for the first time in 25 years. This the non-technical people of the industry are unable to comprehend. Let's face the facts:

We have at the moment two processes which, it is hoped, will free the stay-at-home slaves of parlor Tv: the panoramic presentation as exemplified by Cinerama and Cinemascope; and 3-D films. True, in the first-named process the viewer is "engulfed" by the overwhelming visual impact—but there is no more intimacy or dramatic impact in these wide-screen jobs than there would be in showing a 50-foot image of Kate Smith. Its sole advantage is that of S-I-Z-E. *Dramatic content* must of necessity be, and is, lost.

The foregoing merely touches upon the gargantuan aspects of this, to our mind, sad process. Take a look at Cinerama, for example, from the balcony and you will see the awesome spectacle of Niagara Falls flowing *up*. But even Cinerama recognizes the inevitable: to provide for the light requirements of a screen three times the normal size, it provides, by means of three projectors, three times the normal illumination. Sure, this sort of thing is impressive, but when the catalog of the old Burton Holmes travelogues is exhausted—that is a doleful "that is all."

For Cinerama, the New York installation reportedly cost $50,000! Let's say that in La Crosse, Wis., and its counterparts, they work this price down to a mere $20,000. If there be this sort of venture-capital available today for an industry already reeling from the body blows administered by home Tv, the biggest financial institutions in America have yet to hear about it.

Moreover, granted that La Crosse, Wis., installs Cinerama, the economic forces at work in the industry today (equipment, installation cost for 70% of the theatres in America, and manpower requirements) will, we think, prove insurmountable. Despite the *chi-chi* of main-stem premieres, the motion picture business since its inception has been

(*Continued on page* 24)

FIRST WITH 3-D PROJECTION

MOTIOGRAPH CONVERSION EQUIPMENT IS AVAILABLE NOW!

The first important showing of *Bwana Devil* was made last October at the Greenbrier Hotel, White Sulphur Springs, West Virginia, for executives of United Paramount Theatres.

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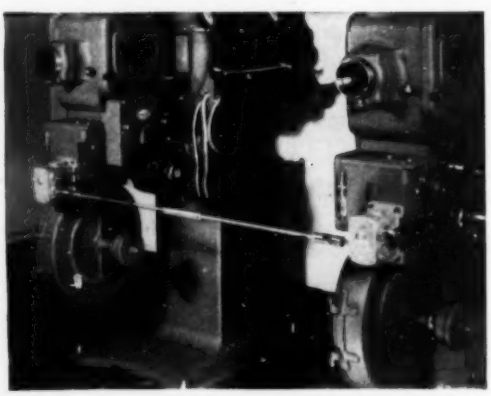


See your Motiograph Dealer today. He will be glad to advise you just what additional equipment is necessary to adapt your particular theatre to 3-D projection. We suggest, however, that you act immediately. No obligation, of course.

MOTIOGRAPH, INC.

4431 W. LAKE STREET CHICAGO 24, ILLINOIS

VOLUME XXVIII MARCH 1953 NUMBER 3

Types of Theatre Sound Reproducers

This is the third of a series of articles analyzing the essential nature of devices that convert sound records into electrical currents.

III. The Sound-on-Film Reproducer

By ROBERT A. MITCHELL

MUCH data anent distortion in sound-on-disk reproduction applies to sound-on-film. An out-of-focus soundhead optical unit, for example, is precisely analogous to a worn phonograph needle. Not only are high frequencies of sound lost when the optical unit is out of focus (or the phonograph stylus worn), but spurious frequencies distortion arise. And uneven motion of the film through the scanning beam gives the same undesirable wows, flutter, *etc.*, as are produced by inequalities in the speed of a revolving disk record.

But there is an important difference between the film and disk methods of reproducing sound. Sound-on-film has no mechanical link between the sound record (soundtrack) and the pickup device (photocell). The "needle" of a soundfilm reproducer is photronic, not mechcanical.

It is not easy to design a soundhead in which the film moves past the scanning beam with a perfectly uniform motion. The most that can be done is to reduce the "flutter content" to a point so low that it is imperceptible to the ear. Many of the early soundheads failed to attain the necessary uniformity of film-travel, hence their performance was seriously marred by a wavering pitch of the reproduced sound.

The first soundheads utilized a stationary "soundgate" through which the film was pulled by a sprocket. Because irregularities in the rotation of the "sound sprocket" introduced objectionable flutter, vibration caused by the driving gears was minimized by attaching a heavy flywheel to the sound-sprocket shaft. The performance of this "damping" arrangement was further improved by non-resonant flexible coupling of the flywheel to the sprocket shaft.

Top Maintenance Necessary

Many of these old-style sound-heads are still in use. Some of them, notably the W.E. models, give surprisingly good results when the sound sprocket, the damping flywheel, and their common shaft are kept in first-class condition. Projectionists operating on these primitive soundfilm reproducers are required to keep the sound gates and their tension pads scrupulously clean and free from accumulations of lint, wax and emulsion at all times. Deposits of dirt in the gate displace the film from the focal point of the optical system, and may even cause a kind of "sticking" which results in sound-flutter.

Regarding the effects of lint or dirt interposed in the scanning beam, much depends on whether the soundtrack is of the variable-density or the variable-area type. In the case of variable-density tracks, there will be no distortion of the sound, but loss of volume may prove serious. But in the case of variable-area tracks partially masked by dirt, actual distortion of the "second-harmonic" type will occur. In rare instances, lint in the sound aperture may vibrate, causing rumbling and thumping sounds.

In the early days of sound pictures, before the application of the "kinetic-scanning" principle, several unsuccessful attempts were made to "damp" the film between the sound sprocket and the gate, thus eliminating irregularities of motion produced by the teeth of the sound sprocket engaging and disengaging the sprocket holes of the film.

In one widely used, but now obsolete, soundhead, for example, we find a free-turning "impedance roller" positioned between the sprocket and the gate. The flywheel was attached to the shaft of the impedance roller, rather than to that of the sound sprocket. The film passed through the soundgate, over the freely revolving impedance roller, then over the sound sprocket (which did the actual work of pulling

the film down through the gate), and finally over the holdback sprocket.

Deficiencies in Early Models

The performance of this soundhead left much to be desired. Although the free-turning impedance roller was intended to smooth out irregularities in the motion of the film, it actually caused more flutter than it eliminated. The reasons are not difficult to find.

In the first place, the film was held in the curved sound gate so tightly by the clock-spring steel tension pads that any damping effect that the impedance roller and its flywheel could possibly exert was effectively nullified. Second, the length of film from scanning point to sound sprocket was so great that uneven shrinkage of the film unavoidably resulted in fluttery sound.

It will be noted that the most satisfactory of the old-time soundheads were so designed that the distance between the sound sprocket and the point of scanning in the sound gate was as short as possible.

Third, excessive tension on the film in the soundgate created a condition whereby the taut loop of film passing around the impedance roller acted very much like a bouncing spring, imparting irregularities to the movement of the film. The last pair of these soundheads in the writer's State were replaced with modern reproducers a couple of years ago.

With the development of the "rotary stabilizer," soundhead design changed radically. The soundgate was replaced by a free-turning scanning drum; and the sound sprocket ceased to act directly upon the film at the point of scanning.

Soundhead Design Changes

The scanning drum of the modern soundhead is a cylinder over which the film passes with a lateral displacement sufficient to permit the scanning beam to pass through the soundtrack without being cut off by the solid drum. The surface of the drum is highly polished to prevent scratching the film. Any dirt or emulsion which may happen to accumulate on the drum should be removed with an orangewood stick, not with any metallic object that might scratch the surface.

The scanning-drum shaft carries a flywheel at its opposite end. This, a self-damping flywheel of special construction, is the rotary stabilizer.

Now, the scanning drum is driven only by the film which is pulled down at the rate of 90 feet per minute by the sound sprocket. But after the free-turning scanner attains normal speed, it continues to revolve, not by the *direct* pull of the sound sprocket on the film but by the "filtered torque" of a small film-loop which automatically forms between the kinetic scanner and the sprocket. Any small irregularities in the rotation of the sound sprocket, therefore, are absorbed by this small loop, or slackness in the film, and cannot affect the rotation of the scanner which moves the film at a constant speed through the scanning beam.

Function of Film Loop

At first thought, this seems very confusing—the film, pulled by the sound sprocket, makes the scanner revolve; yet the scanner moves the film through the scanning beam! The film, however, is not taut between sound sprocket and scanning drum: a "slackness," or small loop, has formed of its own accord. And while sufficient pulling power is transmitted through the loop to keep the scanner revolving, the very fact that there *is* a slackness in the film between sprocket and scanner is insurance against irregularities of movement being transmitted to the film at the scanning point.

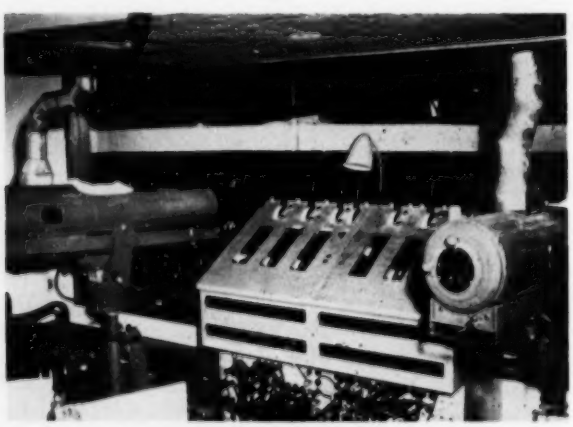
To make certain that it is the revolving drum, and not the sound sprocket, that effects transit of the film at the point of scanning, the film is pressed firmly against the drum by a guide-roller and pressure-pad assembly. So important is the condition and adjustment of this assembly to proper operation of the soundhead that the projectionist should inspect it frequently and lubricate it according to the manufacturer's instructions.

Neutralizes Disturbing Factors

Unlike an ordinary flywheel, the rotary stabilizer neutralizes all forces which tend to disturb the constant speed of the kinetic scanner. The flywheel which is attached directly to the scanner shaft is a hollow drum—something like a sealed, empty can of rugged construction. Inside this can is a smaller, solid flywheel. The heavy, inner flywheel is not fastened to the scanner shaft, however, but is free-turning, mounted on ball-bearings.

The small space between the inner surface of the outer flywheel and the outer surface of the inner flywheel is occupied by oil of proper viscosity. A film of oil is thus the only mechanical connection between the two flywheels of the rotary stabilizer.

The friction provided by the vis-



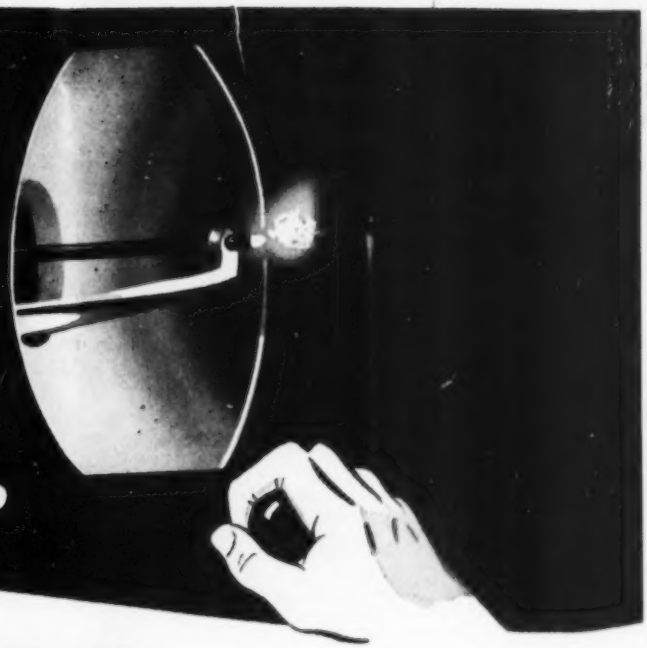
• H-I SPOTLIGHTS BY STRONG DOMINATE NEVADA RESORTS •

The regard held for the proper lighting of the pretentious stage and floor shows presented by Las Vegas, Nev., hotels is evidenced by a picture of a modern and completely equipped control room. The Sahara, Sands, and Flamingo hotels and the Desert Inn have provided for an abundance of exceedingly bright, flickerless light by adopting high-intensity arc spotlights with automatic arc controls. Control room space has been conserved by using adjustable, self-regulating transformers with these spots, rather than spotlights that require heavy rotating equipment. A trim of carbons burns 80 minutes.

Using a two-element, variable-focal-length objective lens system, together with a silvered glass reflector, these hotels can produce a sharp-edged spot from head spot to flood. The horizontal masking controls can be angled 45 degrees in each direction. Fast-operating, 6-slide color boomerangs permit the embellishment of any act by the use of light of any color. Pembrex Theatre Supply Co., Los Angeles, directed the intsallations.

A brochure describing this equipment may be had without cost from Strong Electric Corp., 14 City Park Ave., Toledo 2, Ohio.

NOW over 5000 more theatres can strike a...



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Closely following general acceptance of the sensational, new 9mm "Suprex" carbon, NATIONAL CARBON now offers greatly improved screen light for theatres with variable-feed, mirror-type lamps, using 7mm high-intensity carbons. Specifically, the new "Suprex" carbon provides the following advantages:

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For unequalled uniformity and arc stability, for the *best* in carbons—that research is constantly making *better*—get complete information on this and other recent NATIONAL CARBON developments. Write us—or see your theatre supply dealer who is NOW READY TO SHIP THE NEW 7MM "SUPREX" CARBONS.

ORDER THESE NEW 7mm CARBONS *NOW

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*Not recommended for 1 KW fixed feed ratio lamps.

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cosity of the oil causes the inner flywheel to revolve whenever the outer flywheel revolves. In other words, kinetic energy is transmitted from the outer to the heavy, inner flywheel. Energy, however, can be sent back from the free-turning inner flywheel to the outer one; and such a "kickback" of energy occurs every time a disturbing factor—such as the passage of a film splice over the scanning drum —comes along. The returned energy powerfully resists any change in the constant speed of the scanning drum.

Magnetic Flywheel Used

An interesting variation of the rotary stabilizer is the magnetic flywheel, much used in soundheads of European design. In brief, this flywheel is an accurately machined copper disk revolving in close proximity to a free-turning flywheel faced with powerful magnets. Irregularities in the rotation of the copper disk (which is fastened to the scanner shaft) are suppressed by the energy evolved in the generation of "eddy currents" in the disk by the magnets. Just as a short-circuited dynamo strongly resists rotation of its armature, so does the magnetic flywheel resist mechanical forces tending to disturb the constancy of its rotation.

There are many variants of the magnetic flywheel; but none of them seem to be so effective as is the rotary stabilizer. In fact, most of the soundheads using magnetic flywheels are complicated by the addition of compliance rollers, "flutter suppressors," and other damping gadgets which act directly on the film between the scanning drum and the sound sprocket.

Some of the European soundheads employ a cascade of rollers that makes threading a time-consuming operation. With very few exceptions, American soundheads are characterized by efficient, clean-cut design.

Holdback Sprocket Vital

Every soundhead requires a holdback sprocket to prevent the action of the takeup from being transmitted through the film to the scanning point. Incredible as it seems, manufacturers of "bootleg" and export soundheads have tried to cut costs by substituting a simple tension roller for the holdback sprocket. The attempted "economy" has time and again proved very expensive for the owners of small theatres who, lured by low prices, purchased sound equipment without first consulting competent projectionists.

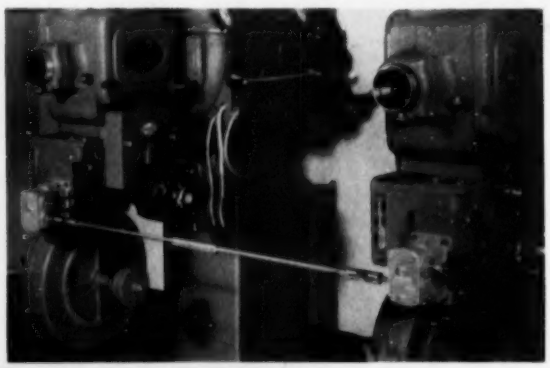
No number of idler rollers can function as a "holdback." If there be no holdback sprocket in a soundhead, then the sound sprocket itself will function as a holdback. Every projectionist knows that the teeth of a holdback sprocket work on the top edges of the film perforations; while the teeth of all other sprockets in a projector work on the bottom edges of the perforations.

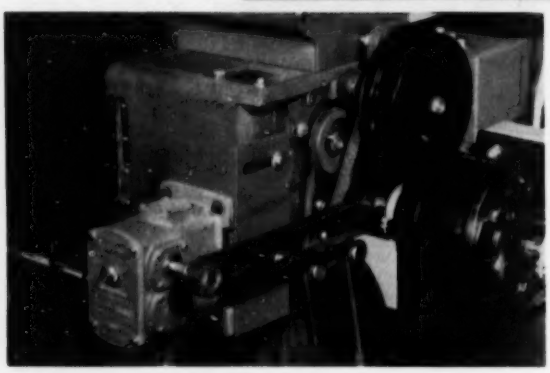
All modern soundheads of good quality, therefore, either have a separate holdback sprocket, or else utilize a single large sprocket which does double duty with the film contacting the sprocket on opposite sides. (Since there is a loop between the two points of contact, tugs and yanks given to the film by the takeup are not passed along to the scanning drum.)

To insure that the gears and sprockets of the soundhead revolve with as little irregularity as possible, the soundhead is driven directly by the projector motor. If the soundhead were driven through the projection mechanism, "gear flutter" might appear in the reproduced sound. "Wows" caused by the takeup are prevented by driving the takeup assembly from a pulley attached to the main drive-gear of the projection-head. An exception is sometimes made when the sound-sprocket

(*Continued on page* 29)

Motiograph 3-D Projector Interlocks Ready





Two views of the Motiograph 3-D mechanical interlock. Over-all view (above) looking from projection ports. Closeup (below) of projection chain drive mounting.

Users of Motiograph sound equipment will have a choice of either a mechanical or an electrical interlock system for adapting to synchronous projection of 3-D films.

The mechanical system, available for immediate delivery, interconnects the Motiograph soundheads through gear reduction boxes mounted on the front of the main castings and joined by a slowly revolving adjustable cross-rod. It is adaptable for use in conjunction with *any make* or model of projector mechanism *employing a standard drive.*

The more costly electrical interlock system using Selsyn motors is furnished on special order only. Mounting and driving details are the same as for the mechanical system, the Selsyn motors merely replacing the gear reduction boxes, and the cross-rod being eliminated in favor of electrical connections through a common starting switch.

In anticipation of increased demand to be created by the release of several new 3-D pictures, production of the mechanical interlock systems is being greatly stepped up. The company asserts that it will be able to meet any demand on short notice.

Strong PROJECTION ARC LAMPS

The Lamps that are SCREEN-ENGINEERED

Screen sizes are not determined on the basis of the lamps which are to be installed. Rather, lamps are selected on the basis of the prevailing or desired screen size as determined by the size of the theatre.

While lamps such as The Mighty "90" would work admirably on any size screen they would be uneconomical and unnecessary with small size screens. Similarly The Utility 1 KW lamp would put a "cheaper" light on a giant-size screen, but the results would be unsatisfactory.

That's why Strong has designed a full range of lamps, a line which includes lamps to exactly fill the light requirements for screens of all sizes. That's why every Strong lamp is engineered for maximum efficiency under a specific set of conditions.

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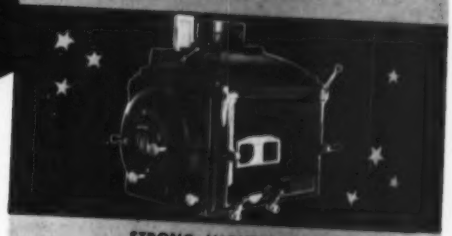
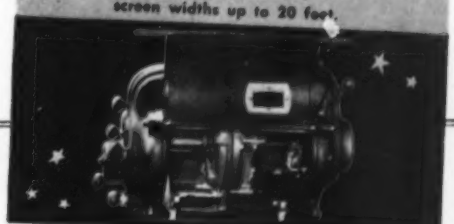


STRONG MIGHTY "90"
75-130 Ampere High Intensity for screen widths more than 24 feet.

STRONG MOGUL
45-70 Ampere High Intensity for screen widths up to 24 feet.

STRONG UTILITY
46 Ampere High Intensity for screen widths up to 20 feet.



STRONG UTILITY
One-Kilowatt 40 Ampere High Intensity for screen widths up to 18 feet.

When the lamps are **STRONG** *the picture is bright!*

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The Film-Cooling Problem

An Exclusive IP Interview with

FRED C. MATTHEWS
Vice-President, Motiograph, Inc.

IS THE German Ernemann projector the *only* "cold" projector? One American manufacturer, Motiograph, has come forward for the benefit of readers of IP with definite comment on the controversial topic of cooling both mechanism and film. Referring to "An Object Lesson in Film-Cooling" by Robert A. Mitchell in the February, 1952 issue of IP, Fred C. Matthews, vice-president of Motiograph, Inc., states:

"Unquestionably, IP is correct in stating that the combination of blower, water-cooled aperture, and filter would make it more certain that the film and projector gate would be desirably cool. Long before the Eastman experiments in air-cooling the projector gate [see the articles by F. J. Kolb, Jr. in the January, February, and March 1950 issues of IP]. Motiograph made available a blower for the Model AA to be used with arcs operating in excess of 70 amperes."

The Motiograph AA Blower

Figure 1 shows the aperture-cooling blower attached to the AA mechanism. The motor which powers the 2½-inch diameter blower is rated at 1/5 h.p. The air is directed through a rigid tube (flexible ones are also available) which enters into the large hole in the casting immediately below the shutter. A duct inside the housing channels the air up to the aperture.

Is this blower of any real advantage? Says Mr. Matthews:

"We are absolutely safe in assuming that our aperture-cooling method is entirely satisfactory. In well over 300 installations there have been no reports of film buckling or in-and-out-of-focus projection."

The European preference for rotary cylindrical rear shutters is indicated by their use over the years in the Ernemann, Euro, and Bauer projectors. This type of shutter is extremely efficient, for unlike the disk and conical shutters, it gives a *double cutoff* of light, one edge moving up through the light-beam while the other edge cuts downward, both meeting in the center. Moreover, it can be designed in several different ways to act as a fan, or air-circulator, thus forcing cool air over the hottest parts of the film and gate.

FIG. 1. Aperture-cooling blower attached to the Motiograph AA projector mechanism.

Cylindrical Shutter Selected

Motiograph, after many years of experimenting with shutters of all types, decided to use the cylindrical rear double-cutoff shutter exclusive of other types, beginning with the H and HU projectors, and continuing through with the modern K and AA mechanisms. In the Motiograph AA the shutter is placed very close to the film aperture for extremely rapid occultation.

The cylindrical shutter of the Motiograph AA is shown in Fig. 2. One end has air-propelling vanes originally intended to keep the shutter bearings cool, but actually proving of great value in dissipating heated air which might otherwise raise the temperature of the gate casting.

"This is not a vague claim," declares Mr. Matthews, "for we know that it really works. We have produced rotors with and without these vanes; and, as a result of field comparisons, we adopted this rotor as standard."

The reader may recall that the new Ernemann X projector utilizes an exhaust centrifuge at the top of the mechanism housing in an effort to draw all heat from the gears and bearings. Both Motiograph and Brenkert also use fans to suck air from the mechanism. Fig. 3 reveals the grating in the Motiograph AA mechanism through which air is expelled by a fan placed directly underneath.

Asked for comment on the value of this exhaust fan, Mr. Matthews replied: "I do not think that this fan is really necessary."

Lamphouse Ventilation Vital

Throwing light upon another angle of the heat problem, the Motiograph executive called attention to the desirability of adequately ventilating the lamphouse, especially when arcs of high amperage are used. To quote Mr. Matthews:

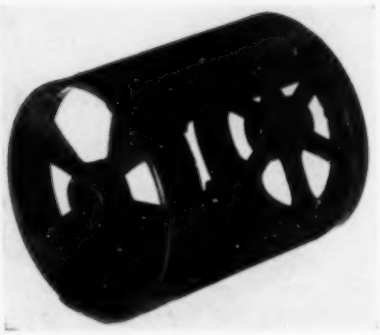


FIG. 2. Cylindrical shutter of Motiograph AA.

"When we made our first installations of 85- and 100-ampere arcs, we discovered that the recommended ventilation system having a blower with a capacity of 400 cubic feet per minute was not powerful enough to dissipate the heat from these high-amperage lamps.

"In designing projection buildings for drive-in theatres we used an arc-lamp ventilating system incorporating a blower of 750 cubic feet capacity. This eliminated a lot of the excess heat and, incidentally, improved arclamp operation. We later incorporated a separate blower in the lamphouse to bring in a supply of air at room temperature into the lamphouse, which also contributed to more satisfactory operation.

"We know definitely that when the new lamp ventilation systems were installed, mirror breakage ceased and the lamphouse exterior was much cooler. Carbon consumption was decreased, and picture illumination was improved.

"Our special lamphouse blower, which operates independently of the main arc-lamp ventilating system, consists of a small centrifugal fan 2 inches in diameter driven by the arc-control motor. This fan forces air into tubes which

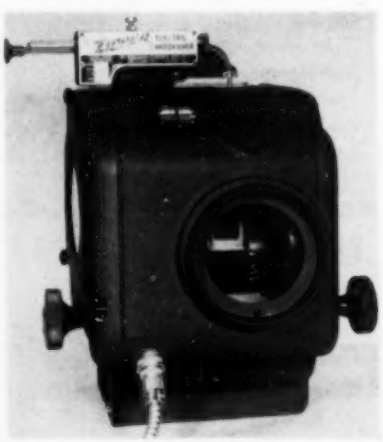


FIG. 3. Air-expelling grating on Motiograph AA.

"Light housekeeping . . . a necessity"

Obvious to everyone may be the fact that not enough light is getting to the screen; or that the sound system is not functioning properly.
The reasons, however, may be varied—equipment failure, inadequate housekeeping, or a drop in power output.
Aid in this type of trouble-shooting may be obtained from the Eastman Technical Service for Motion Picture Film which Kodak maintains at strategic centers to cooperate with producers, processors, and exchanges and exhibitors.

Address:
Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N. Y.

East Coast Division
342 Madison Avenue
New York 17, N. Y.

Midwest Division
137 North Wabash Avenue
Chicago 2, Illinois

West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, California

spread the air around the lamphouse, most of it being directed to the bottom of the mirror."

It is generally agreed that lamphouse ventilation, while of the utmost importance to the overall projection process, exerts no appreciable effect upon the *temperature of the film.*

Film Temperature Unaffected

Heating of the gate and the film is caused solely by the radiant energy contained in the arclamp beam thrown forward by the mirror and concentrated on the film, the aperture plate, parts of the gate casting, and on the shutter. The shutter necessarily absorbs approximately one-half of this terrific outpouring of radiant energy. Some of this heat is dissipated in the air; but some of it is conducted, *via* the shutter bearings, to the mechanism proper.

"Radiant heat," or infrared radiation, is not heat at all *until it falls upon something which absorbs it,* just as black paper absorbs visible light. When something absorbs this radiation, neither reflecting nor transmitting all of it, be it the silver photographic image on the film or metal parts of the motion picture machine, heat is generated. Generation of heat from this cause cannot be prevented.

Visible light also generates heat in this manner. In fact, about 1/3 of the heating effects of the high-intensity arc beam are due to visible wavelengths, and 2/3 to the invisible infrared. Heat filters reduce heating of mechanism and film only by cutting out most of the infrared; but complete reduction of the heat is utterly impossible.

Direct Irradiation the Cause

Direct irradiation is therefore responsible for heating the film and the mechanism, and is indirectly the cause of heating even the edges of the film, even though these are shielded from the direct rays. Whenever film passes through a hot gate, the heated metal transfers some of its heat to *both* the photographic images and the clear film base.

The temperature of the lamphouse and the mirror has nothing to do with the heat-energy latent in the powerful radiance of the arc beam. *Only* the temperature of the positive crater and the reflective efficiency of the mirror determine the power of the beam which illuminates the picture.

But, to repeat the gist of Mr. Matthews' statements, it should always be kept in mind that adequate lamphouse cooling is a prime requisite for satisfactory lamp operation and, hence, a properly illuminated picture out there on the screen.

IP invites all projection-equipment manufacturers to come forward, for the benefit of projectionists everywhere, with observations based upon their own experience with water- and air-cooling of the projector mechanism, the use of heat filters, and the use of auxiliary lamphouse-cooling appliances.

3-D Projection Requisites

By MOTION PICTURE RESEARCH COUNCIL

APPENDED hereto are hot-off-the-griddle (February 19) recommendations of the Motion Picture Research Council (Hollywood) relative to the proper presentation of stereoscopic 3-D motion pictures. The Council is supported by and reflects the views of such eminent motion picture companies as Columbia, Loews (M-G-M), Paramount, 20th-Fox, Republic, RKO, Universal and Warners.

IP recognizes the eminence of both the Council and its member companies, but because it subscribes to the belief that people need not so much to be told as to be reminded, and also because it believes that complete candor ultimately brings its own reward, it hastens to point out that this information in almost identical form was published in IP for January last on page 6.

Moreover, IP wants to extend credit for its first-anywhere report to a tireless worker in the projection vineyards for the past 40 years, Harry Rubin, director of projection for United Paramount Theatres, who immediately upon his return from Hollywood unselfishly made available to the entire industry the fruits of his long and painstaking investigation into the problem of the proper presentation *on the theatre screen* of 3-D motion pictures. The MPR Council report follows:

Such systems consist essentially of taking simultaneously two photographs of the same scene, with the lenses of the two cameras separated so that their view is slightly different. The two pictures are then projected simultaneously in synchronism, with polarizing filters on the projectors, so that the audience (wearing viewers) sees only the right picture with the right eye, and only the left picture with the left eye. Therefore, once a theater is converted for stereoscopic 3-D systems, the theater can show film from *all* producers making such pictures.

In converting the theater, it is necessary to properly align the two projectors, to interlock them so that they will run in absolute synchronism, to use larger magazines and reels in order to minimize intermissions, to adjust rewinds to accept the larger reels, and to project only on a metalized directional screen.

Alignment of Projectors

The two projectors must be aligned so that the vertical and horizontal center lines of the two projectors are superimposed on the screen. The Research Council has prepared Target Test Film so that the projectors can be properly lined up. This test film is available either in the form of short sections for loops or in larger rolls. Sufficient length for loops for two projectors is available for $2 (postpaid). Longer lengths are available in multiples of 50 feet at 8 cents a foot.

Projector Interlock

The two projectors must be locked together so that the right and left prints are projected in synchronism, frame for frame. This interlock can be accomplished either mechanically or electrically. Mechanical interlock is by means of a shaft which connects the two machines. In many cases it is difficult to install as the shaft blocks the front wall control station. In general, the electrical interlock is more positive, results in a cleaner job, mechanically, and will require less maintenance.

Magazine and Reel Size

Since both machines must run simultaneously, changeovers are not possible and intermissions are required while reels are changed. Therefore, larger reels and magazines are needed. In order to allow a show of 10,000 feet with only one intermission, 25-inch magazines to accommodate 24-inch reels are recommended. These reels will hold up to 5000 feet of color positive film or approximately 5500 feet of black-and-white.

Because of their size and weight, such reels must have free-wheeling flanges to minimize strain on the film when the machine is started. Otherwise perforations will be pulled and the pictures will be out of synchronism.

It should be pointed out that either 3-D or regular single-film short subjects or newsreels can be put on, but *only* on, the end of the second (or last) reel of the feature. If the short subject is in 3-D,

both projectors will continue to run to the end of the subject. But, should the short subject be in 2-D it would be added to only *one* of the two reels. Therefore, during the showing of a 2-D short subject the second machine could be disconnected from the interlock and shut down so as to have the first reel of the 3-D feature ready for the next show. The intermission would thereby be shortened, since only the remaining projector would require threading-up during the intermission.

Since the 5000-foot reels permit a showtime of 1 hour and 50 minutes, with one intermission, this time must include both the feature and the short subjects, if any.

Rewinder Adjustment

The rewinds will have to be raised so that the larger reels will clear the rewind table.

Viewers and Filters

The V-type viewers, that is, having planes of polarization of 45 degrees with the vertical must be used. Also, the right-eye print must be projected on the right-hand machine (the machine to the right of the projectionist as he faces the screen). The angle of polarization of this filter shall be the same as the polarization of the right-eye viewer. This right-eye print shall be designated as the Right Print on the identification leader.

Screen Requirements

Metalized directional screens are required. Several types are now commercially available, and the Council is making tests of their suitability. It is possible to spray existing mat screens with suitable metalic paints. Recommendations will shortly be forthcoming on the best type of paints for this purpose.

Exchange, Projection Data

The Council, in cooperation with the Society of Motion Picture and Television Engineers, is preparing information for projectionists concerning stereoscopic projection and for exchanges on assembling prints. Information on the identification leader will be included.

Williams Screen Co. Goes 3-D 100%

Production of silver screens for use with three-dimensional picture projection is now taking the entire facilities of Williams Screen Co., Akron, Ohio. Super-reflective screens, which are adaptable to the peculiar requirements of all 3-D processes and wide-screen systems, have been engineered to assure sharp, brilliant pictures with vivid contrast in any theatre.

These screens, which are produced from seamless plastic, remain permanently flexible. Perforations are clean-cut, with no projecting fibres to impede sound or collect dirt. They are fungus-proof and unaffected by moisture. Every screen is being shipped with a protective coating.

History of the American Labor Movement

Prepared by the U. S. Dept. of Labor, this history traces labor activity and legislation from Colonial times to today.

Chapter VII. Welfare, Political Upsurge

WITH wages stabilized during World War II, paid holidays, paid vacations, health and welfare benefits, and arbitration procedures were written into many agreements for the first time. The postwar period has witnessed a marked growth in the number of contracts with such provisions. Another feature of contracts negotiated within the last 2 years is the liberalization of previously established practices, such as the increase in the numbers of paid holidays, provision for an extra week of vacation to employees for long service, and extension of the coverage or increase in the benefits under insurance and other welfare plans.

Welfare and retirement plans under union contracts covered at least 3 million workers by mid-1948. In 1949 and early in 1950, there was an increase in welfare and retirement plans under collective bargaining. By mid-1950 over 7½ million workers were covered by such plans. In addition, many AFL international unions and their locals have for many years maintained benefit programs financed entirely by membership dues or assessments. About 70 AFL affiliates disbursed approximately $67 million for death, sick, unemployment, old age, disability, and miscellaneous (including strike) benefits in 1949.

Paid Vacations a 'Must'

The interest in vacations as an objective of collective bargaining is reflected by the rapid increase in the number of agreements providing vacations. In 1940, only about 25% of all workers under union agreements were entitled to paid vacations, as compared with 85% (11½ million workers) in 1944. Currently, virtually every union agreement contains provision for a paid vacation.

The majority of agreements run for fixed periods, usually 1 year, after which they may be automatically renewed by mutual consent or renegotiated by the parties. Some agreements of longer duration contain provisions for special renegotiation of the wage clause during the life of the over-all agreement. Other agreements provide for wage adjustments in the event of increased productivity or cost-of-living changes. Provisions for cost-of-living adjustments tied to the consumers' price index of the United States Bureau of Labor Statistics gained special prominence during the latter part of 1950, when prices surged upward because of the Korean war.

Other Functions and Activities

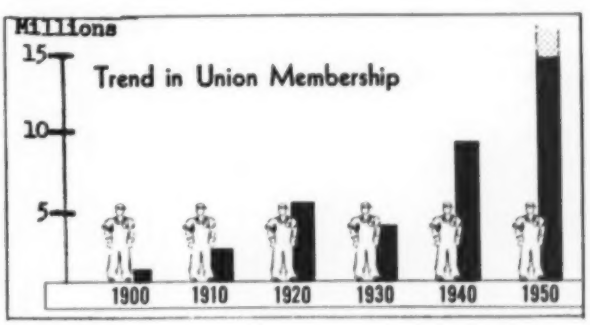
As labor unions grow, their activities and obligations to their members expand. New services are provided. Many unions have established research and education departments to assist the international union officers and local union committeemen in developing facts and statistics for use in collective bargaining. New members have to be informed and kept abreast of developments within the union and the Nation. For this purpose, newspapers were started and educational classes or "institutes" were organized.

The expanding role of the union in the community, State, and Nation drew labor representatives into various public agencies and groups to give expression to labor's interest in politics, education, welfare, charitable, and other civic undertakings.

Union functions may now be classified broadly as follows: administration of internal union matters; negotiation and administration of collective agreements; educational and beneficial activities; and participation in community, State, and National affairs.

Administration of internal affairs involves the holding of conventions and meetings of the executive board, direc-

(*Continued on page 26*)



These figures are based on reports from Unions to the Bureau of Labor Statistics, U. S. Dept. of Labor.

Tv Projection with I-O Cameras

Since early in 1951 WABD-Tv, key station of the Du Mont Tv network, has been using image-orthicon cameras for the transmission of all film transmissions. The projection phase of this operation is discussed in the appended excerpt from a report by the Du Mont engineering section.*

By R. D. CHIPP

Director of Engineering

Du Mont TV Network

OVER the past two years there have been a number of discussions concerning the use of the image-orthicon pickup tubes for the transmission of film. These have covered, in some detail, the characteristics of such tubes, and the basic design of film projectors for television. They have also suggested some of the advantages and the disadvantages of film cameras using image orthicons.

By early 1951, WABD was using Type 5820 image orthicons for all film transmission. It should be emphasized that we were primarily concerned with consistently good reproduction of films of uncertain vintage and quality, rather than with excellent reproduction of a few films especially made and processed for Tv.

Projection Room Layout

The WABD projection room was originally laid out in March 1946, equipped with two Simplex 35-mm and one Victor 16-mm projectors. These had been modified for 2-3-2-3 pull-down. In 1948 we added two Du Mont-Holmes, Model 5130C, 16-mm Tv projectors. These were placed and mounted as shown in Fig. 1.

Mounting details for the 16-mm projectors, which weigh approximately 300 lbs. are shown in Fig. 2. The concrete base weighs approximately 500 lbs. and provides extremely steady operation. Tests for picture stability are better than the proposed RTMA/SMPTE specifications, and no mechanical changes have been necessary to adapt any of the projectors to image-orthicon use.

The cameras are standard Du Mont equipment, Model TA-124, normally used in studios and in the field. Each is equipped with a 90-mm, F:3.5 lens and so placed with respect to the screen that the photo cathode is 18¾ inches distant. The only change required was reversal of the horizontal sweep, which is accomplished by switching two leads on the deflection yoke. The cameras are aligned and adjusted in a conventional manner, using the "knee-of-the-curve" technique.

Intermediate Screen Used

The original projection room was equipped with iconoscope cameras mounted on tracks. These were moved into position in front of any one of the four available projectors, which were separated from the cameras by a fire wall. This was a conventional arrangement. In order to substitute image-orthicon cameras, with no disruption of a heavy operating schedule, it was decided to retain the same method of camera mounting. This, in turn, precluded use of direct projection, and indicated use of an intermediate screen between the projector and camera.

The 16-mm projectors, originally equipped with 4-inch lenses for iconoscope use, were refitted with 2-inch, F:1.9 lenses to produce a 3⅜ × 4½-inch image on the screen. The 35-mm projectors, originally equipped with 8½-inch lenses, were refitted with 5-inch, F:1.9.

FIG. 2. Mounting of 16-mm projector.

Tests of many screen materials were made. Among the materials tested were tracing paper, standard rear-projection material, experimental translucent plastic, latex, ground glass and flashed opal. In view of the relatively small image size, most of these materials were discarded because of excessive grain. From the standpoint of minimum grain and minimum light dispersion, latex appeared to be superior to other materials. However, it aged rapidly, changed color, and was difficult to keep clean.

Ground glass, which did not have these undesirable characteristics, was finally selected as satisfactory for practical use. A metal hood is used to prevent stray light from reaching the screen from either side. Figure 3 shows the hood from the projection-room side, and Fig. 4 from the camera side. Note in Fig. 4 the detent mechanism

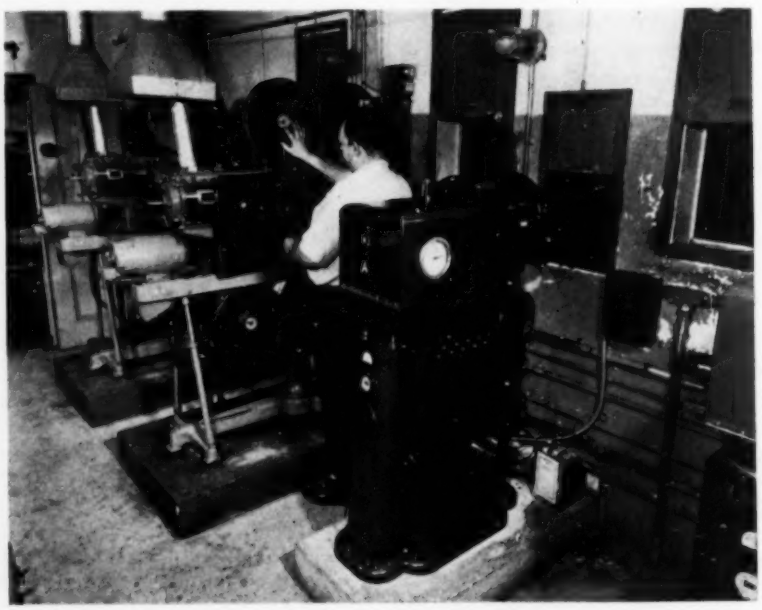


FIG. 1. WABD-Tv (N. Y.) projection room layout for I-O film transmission.

* "Film Projection Using Image-Orthicon Cameras," by R. D. Chipp; J. Soc. Mot. Pict. & TV Eng., Jan. 1953, p. 1.

which permits the rapid movement and precise location of the cameras.

Substantial Light Reduction

As is well known, substitution of image orthicons for iconoscopes requires a substantial reduction of the light intensity to secure operation of the pickup tube at the proper point on the characteristic curve. Many means of accomplishing this have been suggested. We elected an extremely simple method: the substitution of a 300-watt projection lamp for the usual 1000-watt lamp. These lamps are operated at 90 volts instead of the nominal 115 volts. Screen brightness measurements, with no film in the gate, showed 125 foot-lamberts uniform within approximately ±10 foot-lamberts.

In order to reduce the light output of the 35-mm projectors to equal that of the 16-mm projectors, we dropped the arc current from 25 to 20 amperes and added neutral density filters having 40% transmission. With the opening of the Du Mont Tele-Center in New York, new and less expensive light sources, now under investigation, will be used.

With most film, and a Type 5820 Image Orthicon, the camera lens may be stopped down to F:5.6. When using a 5826, a typical aperture is F:3.5. These lens settings are average. We have observed that the sensitivity of image orthicons of equal age may vary from tube to tube by a factor of 5. Sensitivity may also change with age by a factor of as much as 10. These variations are equalized by changing the lens stops. As indicated above, we have used both 5820 and 5826 for film transmission. The 5826 provides improved signal-to-noise ratio, and a somewhat better gray scale. Under some circumstances, with very dark scenes or very dense film, some adjustment to the iris is made.

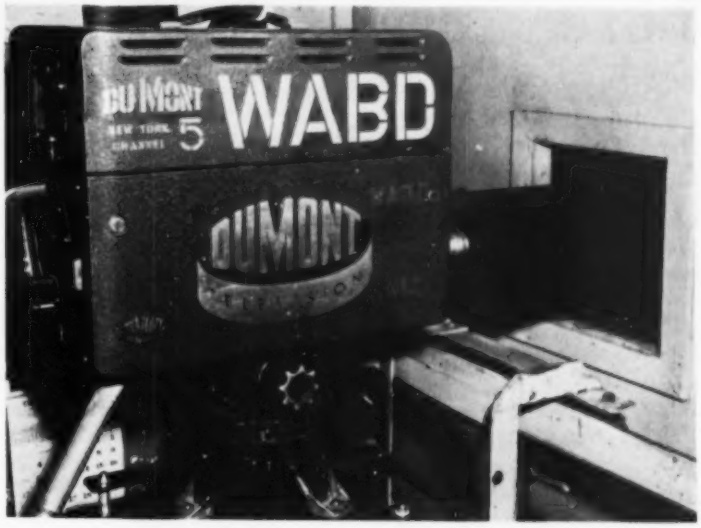


FIG. 4. Light shield on the camera side of the fire wall.

Excerpts From Discussion:

Q. If there's a problem due to grain of the screen material, can't that be eliminated by just using a larger image on the screen?

Ans. Yes, it could. Perhaps I didn't stress sufficiently the physical problem that we had in using an existing location. Now, when we move to our new studios—if we do not use direct projection into the tube, we will use a larger screen.

Q. I wonder if you must form a first image on the screen. I'm not sure what your optical system is, but it would seem that the screen can be eliminated.

Ans. Well, the optical system is conventional in both the projector and the camera, so that we form an image on the screen. . . .

Q. There is then no reason really to form a first image. All you need is a field lens between two lenses.

Ans. Yes, that's probably true. I think investigation might show the field lens would be something rather expensive.

Q. Also, a field lens could be very cheap and very simple as long as it's in the plane of the first image. Every microscope uses this in almost every optical system. It's used to carry an image through several lenses.

Ans. That might be the case. We haven't fully investigated that.

Q. What do you do in case of stills?

Ans. We use the flying-spot scanner for all slides. In case of a program where there may be a series of titles, we use title cards in the studio. They're picked up by the studio image orthicon.

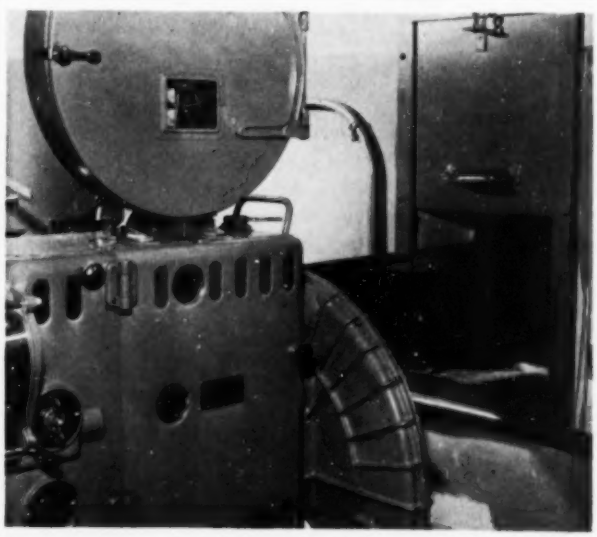


FIG. 3. Light shield in front of 35-mm projector.

SMPTE Coast Meet, April 27-May 1 to Feature 3-D, Drive-ins

Stereoscopic motion pictures and the engineering of drive-in theatres stand out in the schedule of sessions for the Society of Motion Picture And Television Engineers' 73rd Convention at Los Angeles, April 27—May 1. Other special subjects slated for serious discussion are color television standards being developed by National Television Systems Committee, subscription television, magnetic recording and editing and high-speed photography.

Barnett to Cinerama Exec Post

Herbert Barnett, formerly assistant to the president of General Precision Equipment Corp., has been named executive vice-president of Cinerama, Inc., the company holding the license to manufacture the equipment used in the projection of Cinerama films.

These 'Curved' Screens

DECENT interment rites having been observed years ago, it occasions no little surprise that some segments of the projection field have again interested themselves in the possibility of correcting certain deficiencies in the projection process by utilizing a "curved" screen. So alarming is this renewed interest in a technological corpse, that we hasten to deliver another—and, we hope, final—graveside sermon over that which, it was thought, had long since departed this world.

The curved screen was sired by a combination of muddled technical thinking, smart promotional minds, and theatre owners who don't know the difference between a photocell and a projection lens.

The curved screen was touted as capable of accomplishing the following chores: (1) correction of distortion; (2) elimination of "hot spot" and glare; (3) creation of an "illusion" of depth; (4) improvement of sound transmission; (5) elimination of the "keystone" effect, and (6) the screen "could be washed like glass."

The most recent curved screen is composed of two surfaces: the first sheet is loosely woven, while the second surface, 2 inches behind the first, is very tightly woven. Both sheets are laced to the frame.

The passage of light through these dissimilarly-woven surfaces is asserted to enhance the illusion of depth and eliminate screen lines and glare by diffusing and *polarizing* the light. Let's see about this and other assertions made in behalf of such a screen.

1. Screen-Image Distortion

Far from eliminating distortion, the curved screen *creates* it! To patrons sitting at the extreme right and left front seats such a screen does appear to lessen distortion—but this is only because parts of the screen are *hidden from view* by the curvature. In all other seats throughout the theatre the screen creates distortion.

Because the screen is curved, not flat, horizontal straight lines appear bowed, while vertical straight lines are variously curved, depending upon the camera angle and the seat from which the screen is viewed. Look, for example, at these current wide-screen jobs. From the balcony, the waterfall flows *up!*

Titles shown on such a screen come up curved instead of in a straight line. In the case of vertical straight lines—for example, a microphone stand in a scene where the camera is "panned"—the stand bends like a bow, alternately bending and bowing. Projection images on a curved screen distort the focus, because one cannot focus on a single plane.

The distortion occasioned by the location of seats too far over at either side of the theatre is not, optically-speaking, true distortion but merely the familiar law of perspective. Such screens as have been devised in an attempt to compensate for this deficiency, while they may add to the illusion of naturalness, can never circumvent the laws of perspective.

The important thing to remember is that this type of "distortion" is not *true* distortion but the natural perspective seen when viewing anything obliquely.

2. 'Hot Spot' and Glare

In front-projection the correction of a "hot spot" (so-called because of a concentration of light within a spot at the center of the screen and a deficiency of light elsewhere within the screen area) is definitely not a function of any screen, but rather is it solely a question of the optics of the projector.

As to glare, a curved screen produces *more* not less, glare.

3. Illusion of Depth

No data advanced by the proponents of curved screens—nor, for that matter, *anything* in the literature of the art prior or present—lends any credence to the assertion that a curved screen contributes in even the slightest degree to an enhanced illusion of depth.

4. Sound Transmission

The assertion that a concave screen improves sound transmission is just not true, and, in fact, this is not a function of *any* type screen. All screens impair sound transmission to a certain measurable extent, and the curved screen is neither better nor worse in this respect. The answer is to go to stereophonic sound.

5. The Keystone Effect

Elongation of the projected image is caused by steep projection angles. The same is true of "keystoning," which is the widening of the image at the bottom of the screen, with its characteristic convergence of vertical lines toward the top.

These deficiencies could be corrected somewhat by tilting a flat screen to a suitable, but impractical, angle; but the effect anywhere but in the center of the theatre is usually so grotesque as to render futile any such course of action. A *curved* screen cannot eliminate keystoning except at certain places where the curvature assumes the same impractical angle.

6. 'Can Be Washed Like Glass'

This is a false and wholly misleading statement. With ordinary glass, dirt which gathers on the surface may be rubbed off. The curved screen consists of a grouping of glass threads between the fibers of which dirt collects. As with any fabric, the dirt must be *washed* out by laundering.

Because these screens depend for sound transmission upon small pores in its weave—as contrasted with the large perforations in conventional screens—it is definitely a dust trap. In this respect it is similar to the earliest sound screens, which were woven and not perforated and which soiled with amazing speed.

Any curved screen necessarily would have to be taken down frequently and laundered; and if the show is to continue uninterruptedly, the theatre would have to have a replacement screen available or pay overnight laundering charges. This is a major maintenance problem.

Thus the story anent the curved screen. IP would welcome comment from anybody having anything interesting to say on this topic, and particularly from projectionists who have used or, possibly, are even now using a curved screen.

Kodak Pays Largest Wage Dividend

Eastman Kodak Co. paid this month the largest total wage dividend in its history. About $22,500,000 was paid to 52,000 Kodak employees throughout the country. Those eligible received $27.50 for each $1,000 earned at Kodak during the five years from 1948 to 1952. Last year's dividend rate was the same, but the total paid was about $20,000,000.

Outline of 16-mm Projection

Presenting some comments on the history and operation of 16-mm projectors, abstracted from a very complete text-book on the subject.*

II

TODAY, 35-mm prints are used almost exclusively in the motion picture theatre; 16-mm prints are used almost exclusively by the Armed Forces of the United States in the training of military personnel. 16-mm prints are also widely used for educational and industrial purposes; 8-mm is now reserved almost entirely for amateur and personal purposes.

So far, the optical reduction of 35-mm to 16-mm has accounted for the largest percentage of prints released in the 16-mm size.

[The picture for 16-mm prints is now obtained from dupes from the original negative; the sound is re-recorded on a 16-mm sound negative and contact-printed for the release print.]

In a small number of newsreel theatres, 16-mm sound projectors have been installed beside 35-mm projectors facing the the same theatre screen. A screen width of 15 feet has been the maximum so far, such projection requiring an efficient arc lamp (or equivalent) operating at a current of about 50 amperes or more to provide sufficient screen brightness. With very good control of film quality, the projected 16-mm films compare favorably with run-of-the-mill, 35-mm prints that may be used for comparison.

Another overlap of interest in recent years is the "blowing up" of 8-mm to 16-mm, and of 16-mm to 35-mm films. Much of the combat war material shown in entertainment theatres was originally taken on 16-mm film. Typical examples have been the many air combat scenes photographed with the GSAP (Gun Sight Aiming Point) camera, a 16-mm camera designed to take pictures of an enemy target when the machine guns or other guns of the combat plane were fired. Where originals were well exposed, well handled, and well processed, the results were satisfactory.

Comparative Characteristics

The comparative table (Table I) indicates the relative sizes, weights, and like characteristics of 35-mm, 16-mm, and 8-mm.

16-mm was originally intended to be simple and low in cost. It is not reasonable to expect 16-mm apparatus and methods to be merely scaled-down versions of 35-mm apparatus and methods. Simplicity, reliability, operating convenience, small size, and economy are essential requirements—without these, 16-mm film fails its real purpose.

A 16-mm image is so small that the average unaided eye is incapable of distinguishing the fine detail in it. To make such small images convenient to view, they are enlarged in projection. In the case of a screen 6 ft. wide (a common size) the magnification in projection is equal to the screen width (in inches) divided by the projector aperture width (in inches), or 72 divided by 0.384; the ratio is 190. Such magnification is common with 16-mm projectors using a 750-w. lamp. (The screen illumination will be somewhat low when this magnification is used with the average projector.)

Screen Brightness

When a projector with a suitable light source such as an arc lamp is used, a screen 12 ft. wide can be filled comfortably. Ordinarily, such projection requires approximately 35 to 50 amps. for the arc to provide adequate light output with an efficient arc lamp. This latter case represents twice the magnification of the previously cited example, or 380. With really high-grade lenses, film, equipment, and operation, the quality of projected picture leaves very little to be desired in comparison with conventional 35-mm picture projection under comparable conditions of screen illumination.

If a motion picture is to be viewed properly, the screen must have the correct level of illumination in foot-candles in order to provide the correct level of reflected light in foot-lamberts. For 35-mm motion pictures, the ASA Standard Z22.39-1944 "Screen Brightness for 35-mm Motion Pictures" requires that "the brightness at the center of a screen for 35-mm motion pictures shall be 10 plus 4 minus 1 foot-lamberts when the projector is running with no film in the gate."

A conventional 16-mm projector using a 750-w., 25-hour-life lamp should have a light output, if excellently designed, of 275 lumens; the minimum acceptable should be 200 lumens. At this light level and efficiency, the projector will have 10-foot-lamberts output if the reflection factor of the screen used is about 70% and the screen about 5 ft. wide. If a 1000-w. lamp of 10-hr. life is used to replace the 750-w. lamp in a properly designed system, the light output of the projector will be increased to 385 lumens and the screen width may be increased to about 6 feet.

[TO BE CONTINUED]

Shot-in-the-Arm Eating Next?

Tomorrow's music record shop may look like an automat where you'll drop a spool of magnetic wire into a slot and get it back with the latest song hits recorded on it. This possibility is envisioned by Chicago's Marvin Camras, senior physicist with Armour Research Foundation. When the songs' popularity has waned, the spool would be magnetically erased and the coin-in-the-slot vending machine would again electronically imprint the current favorites.

The inventor believes the idea of using the same spools would save money and prevent accumulation of dead reels in the home collection. Camras also sees the day when spools might be sent mail-order to a central headquarters for re-recording.

TABLE I. Characteristics of Various Sizes of Films

Characteristic	Size		
	35-mm	16-mm	8-mm
Length, ft.	1000	400	200
Linear speed,[1] ft. per min.	90	36	18
Running time, min.	11.1	11.1	11.1
Relative length	2.5	1.0	0.5
Relative weight and volume	5.5	1.0	0.25
Relative area for picture	4.6	1.0	0.25
Relative area for sound	3.15	1.0	...

[1]A speed of 24 frames per second is assumed.

*Cond. from "16-mm Sound Motion Pictures," by W. H. Offenhauster, Jr., published by Interscience Publishers, Inc., New York.

IN THE
SPOTLIGHT

MASSACHUSETTS has long had two-men theatre projection shifts *via* a ruling by the Commissioner of Public Safety. Recently, three theatres joined in a court action to void this ruling, with their case being based mainly on the contention that the introduction of cellulose acetate (safety) film eliminated the fire hazard and rendered unnecessary the two-men shift. A superior court judge not only ruled in favor of the theatres but took the unprecedented step of allowing his ruling to stand *pending appeal* to a higher court.

These goings-on will surprise no projectionist, although we might repeat for the umpteenth time that the question of picture *quality* was not even mentioned in the proceedings. After all, what theatre owner is the least bit interested in the *kind* of screen image offered? The paying patrons, the dumb clucks, wouldn't know the difference.

Thus the projectionist craft is once more the victim of its own conscientious effort. Cellulose acetate film was nursed and coddled in its first showings by the craft, and it was one hell of a long time before proper handling technique overcame its inherent deficiencies. So much for that.

Let this Massachusetts action be a guide to the craft when negotiations for 3-D and other special processes come along. Chicago Local 110 stuck to its manpower guns with the Cinerama people, although the Local was castigated *via* the wire services from coast to coast. We're glad and proud that the Local stood fast; and we hope that every other element in the craft, big city and small town alike, asks for and gets its full manpower quota *at the start* —and keeps pitching.

• The growing tendency of American motion picture stars to make pictures abroad, thus not only depriving Uncle Sam of millions of dollars in tax revenue, but also forcing thousands of Hollywood studio workers out of jobs, came in for caustic comment by IA President Richard F. Walsh at the recent AFL conclave in Miami. In his blast against these stars, Walsh said that while he did not object to film-making abroad when foreign locales were essential, he did object when they were made abroad *solely* as a means of dodging U. S. A. taxes.

He pointed out the loopholes in our Federal tax laws which permit American citizens to evade payment of U. S. income taxes if they are out of this country for 18 consecutive months, or more. The IA head asserted that he had the assurance of AFL support in a campaign to plug this loophole by Congressional action.

In Memoriam
HARRY SHERMAN
March 3, 1952

The Central Union Label Council of Greater New York (City) representing 500,000 organized AFL workers, unanimously passed a resolution last month condemning these tax-evading practices. The Council urged all affiliated organizations to lend their support to the IATSE in its campaign against such "unfair competition."

The National Public Relations Assembly, a non-partisan body, has asked Walsh to issue an "information list" each month containing the names of pictures made abroad by American movie stars, or other American personnel "clearly and unquestionably for the purpose of taking advantage of the 18-months tax dodge." The tax dodge has become widespread, and as a result thousands of "little people" movie extras, technicians, *etc.*—are out of work.

"The information would be placed before the wage-earning moviegoers of the nation merely for checking purposes," said a spokesman for the Assembly. "Every person would do as he saw fit about patronizing any film made overseas by a tax-dodging American movie star. . . . If such a monthly listing is widely published in the bona-fide labor press of the nation, the unemployment situation in Hollywood will be cured within a few months."

• Our belated congratulations to the J. E. "Frenchy" Biencourts on the arrival of a baby boy in their household. "Frenchy" Biencourt is the popular business representative for San Antonio Local 76.

• Added to the ever-growing list of New York Local 306's long-time members who have retired from the craft and are now receiving the benefits

37th ANNIVERSARY CELEBRATION HELD BY LOCAL 512, SPARTANBURG, S. C.

A banquet held in the Franklin Hotel Ballroom, Spartanburg, S. C., marked the recent 37th anniversary for Local 512. Shown here is a group of members and guests at the party. Seated at the table, left to right, are Local 512 members: Ray Wiliams, vice-president; Kent Walker, E. S. Moore, A. J. Lancaster, R. S. Beam president; John R. Beam, Paul E. Kelley, business representative; G. B. Spillers, Henry Childress, and Ray Williams, Jr. Standing, left to right: Joe Gaffney, president, Local 518, Augusta, Ga.; J. F. Bendingfield, Local 518; Guy Bryson, business representative, Local 697, Greenville, S. C.; J. Sizemore, E. Chastaine, Local 697, and Van C. Ivey 518.

of the Local's pension plan are 25-30 Club members Mike Berkowitz, Harry Mackler, Joe Abrams, Sam R. Rubin, and Harry Hilf. These old-timers have given many years to the craft and helped smooth the road for the younger members.

• The Labor-Management School of the University of San Francisco opened its Spring 1953 session on February 18, and will conduct classes until April 8.

• Lester B. Isaac, director of visual and sound projection for Loew's, Inc. for the past 25 years, has been appointed assistant general manager of theatre operations in charge of technical services for Cinerama. Isaac is slated to assume his new duties on March 6.

• In the recent balloting conducted by the regional office of the National Labor Relations Board, an overwhelming majority of film service laboratory technicians in Hollywood, Calif. voted for the IATSE to act as their bargaining representative. They are now members of Laboratory Technicians Local 683.

• Our congratulations to the Frank M. Blakes, Local 224, Washington, D. C., on their 42nd wedding anniversary.

• Robert Greer, past president of Local 386, Columbus, Ohio, and president of the Columbus Federation of Labor, attended the AFL Community Chests and Councils' conference in Atlanta, Ga., as AFL representative of the Columbus Community Chest Staff.

• It is high time, we believe that due recognition is given to those IA men who consistently, year in and year out, give up much of their leisure time to bring a bit of cheer into the lives of the physically handicapped and the chronically ill. Last month in these columns we mentioned the fine work being done by the New York Local 306 Movie Social Club of Brooklyn in bringing entertainment to the crippled children of St. Giles Hospital, Brooklyn.

Now we're proud to tell of the volunteer project inaugurated May, 1936, by Abe and Ben Sherman, members of Philadelphia Local 307. Every Sunday for the past 17 years one of these brothers appeared at the Lucien Moss Home for Incurables in Philadelphia and put on a show for the shut-in patients. A complete feature film is furnished each week by Ben Amsterdam, president of Atlantic Theatres. Harry J. Abbott, 6th IA vice-president and president of Local 307, was instrumental in having the projection equipment donated to the Home. Thus, through the unselfish cooperation of all these fine people, the lot of the unfortunate shut-in is made a bit more bearable.

The General Executive Board of the IATSE, after a week-long series of mid-winter meetings in Las Vegas, has empowered President Richard F. Walsh to "press to the utmost" the drive for Congressional action to stop the tax-dodging activities of American movie producers and players abroad.

The IA feels that if the tax rates are applicable to *all* U. S. citizens, the movie people will, of necessity, elect to confine their production activities to the U. S. (Hollywood), thus providing employment for many additional thousands of technicians.

• Clyde Cooley, was recently re-elected to serve his 14th consecutive term as secretary of Local 343, Omaha, Nebr. Clyde is one of the best known IA men in the Middle West, having represented his Local at the last 10 IA conventions. In addition to his Local 343 duties, he holds the office of secretary-treasurer for the Nebraska State Association and edits the popular weekly column "Movie Operators," a regular feature of *The Unionist*, official publication of the Nebraska State Federation of Labor.

• Seven months' negotiations between New York Local 1 and the legitimate theatre operators were concluded recently with an agreement providing for an 8% increase in basic wages for

STAGE AND MOVIE STARS ADD GLAMOUR TO COLUMBUS LOCAL 386 CELEBRATION

A gala party marked the recent 34th anniversary celebration for Local 386, Columbus, Ohio. Among the invited guests present were officials of nearby IA Locals and the entire cast of the play, "Country Girl," which closed its engagement in Columbus that night. Shown standing in the top photo, left to right, are the following officials of 386 and guests: Willis Persons, sergeant-at-arms; Tony Albert, "Country Girl" stage manager; John Fitzgerald, IA representative; Robert Greer, president of Columbus Federation of Labor and former Local president; H. Meade Feathers, vice-president; Bill "Dutch" Weltz, recording-secretary; David Cornwell, secretary-treasurer; Donald V. Gardner, president; Calvin Beard, financial-secretary; Ned R. Welch, business representative, and Harold Farmer, member of "Country Girl" cast. Members of "Country Girl" are seated at the table, on the far side of which may be seen the stars of the play — Nancy Kelly, Dane Clark and Sidney Blackmer, fourth from left.

Shown in the bottom photo, left to right, are: Kenny Mason, treasurer, Local 823; Carl Young, business representative, Local 12; R. G. Neff, business representative, Local 349; Donald V. Gardner, 386; Phil Ryan, property man for "Country Girl"; D. R. Barnecle, secretary, Local 30 (Ind.); Ned Welch, 386; W. W. Hofferbert, Dayton, Ohio; Al Reid, carpenter, "Country Girl"; Harold Souder, president, Local 12; John E. Krebs, business representative, Local 327, and IA Representative John Fitzgerald.

Tax-Free Production Abroad is Reflected in Export Slump

U. S. exports of motion picture films and equipment in 1952 were valued at $25,692,819, about 8% below the 1951 exports valued at $28,053,500, it was announced today by Nat D. Golden, U. S. Dept. of Commerce. Noteworthy in this decline was the lower exports of *exposed feature films* and the drop in exports of all types of rawstock film except 35-mm positive. With the notable exception of 16-mm sound projectors, practically all types of motion picture equipment were exported at lower levels in 1952.

No. 1 men. In addition, the pact also provides for a retroactive increase of 5% to July 31, 1952, and for a 5% boost in overtime pay. The new agreement became effective February 16, 1953, and will run to July 31, 1955.

John C. McDowell, secretary, and business representatives Solly Pernick and John Goodson, served on the negotiating committee for Local 1; James F. Reilly, executive director of the League of New York Theatres represented the theatres.

• Harry Owen, member of Detroit Local 199 and projectionist at the Century Theatre, has recovered sufficiently from the broken neck he sustained in an automobile accident to have his neck braces removed.

• Rochester Local 25 (stagehands), with a membership of 55, donated $311 to various worthy causes during its regular meeting last month. Mike Mungovan, business representative for the Local, revealed that the members unanimously approved motions from the floor to donate $226 of this sum to the Will Rogers Memorial Hospital at Saranac Lake, N. Y.

• Ten sweeping amendments to correct the "oppressive" Taft-Hartley law were urged by George Meany, AFL president, when he appeared as the first witness before the House Labor Committee's public hearings on revision of the six-year-old Taft-Hartley law. Meany asked Congress to repeal such key provisions as the 80-day anti-strike injunction, the ban on the closed shop, the requirement that union leaders sign a non-Communist oath, and the provision that permits employers to bring damage suits against unions.

These provisions, and others, have "placed intolerable restrictions upon the exercise of basic rights and freedoms by trade unions and their members just because they are part of organized labor," Mr. Meany asserted.

• The projection of 3-D films, particularly those "first-in-town" presentations, are netting the industry in general, the theatre, and the projection craft in particular, valuable publicity space on newspaper amusement pages. A few technical details as to the "how" of the process will do the trick, was exemplified recently when the boys at the Metropolitan Theatre in Boston (Local 182) grabbed important space in the *Boston American*. The crew: Paul Brown, Charles Jandrue, Harold Sheerer, Ernest Costa, and James Lyden.

• So-oo-oo . . . IP is proving to be a disruptive influence on the flow of regular business at Local Union meetings. So states Lester Barager, secretary of Rochester, N. Y., Local 253, in the course of describing elsewhere herein the wiring for 3-D installations.

• Face-to-face it's easy if not imperative to say nice things about a guy. But when such comments are made behind one's back—well, they must really like you! That's what happened at the recent 34th anniversary party of Local 386, Columbus, Ohio, when of the three honor guests—William Smith, Fred Hartwick, and George Halliday, all charter members of the outfit—only the latter was present. Halliday accepted the Local's gifts on behalf of his pioneer buddies from Nancy Kelly, star of stage and screen. Incidentally, Smith is the only man to hold a gold life-membership card in 386.

• New York Local 306 is bringing suit against the Loew and RKO circuits and the Radio City Music Hall in the Metropolitan New York area for $3 million which the Local claims its members earned for uncompensated overtime work during a period extending back almost six years. About $1 million is being sought from each company.

Herman Gelber, president of Local 306, states that this back pay is due projectionists for pre-show preparatory work estimated at between 15 minutes and one hour daily. Demands have been made over a period of years to reach an amicable agreement, he said, but it was impossible to reach a settlement.

Suit is being brought at this time because further delay would allow the exhibitors the protection of the six-year statute of limitations.

• Copies of a folder prepared by the AFL Research Department to help AFL unions—with escalator clauses in their contracts to shift from the old cost-of-living index to the new one, have been sent to officials of all AFL national and international unions. A letter accompanying the folder comments that the old Bureau of Labor Statistics Index will be continued for six months, in compliance with an AFL request for the continuance, in order to facilitate changes from the old to the new index.

IA ELECTIONS

LOCAL 249, DALLAS, TEXAS

Paul W. Humphries, *pres.*; Curtis Moore, *vice-pres.*; Harvey Hill, Jr., *rec.-sec.*; Earl Medlin, Jr., *fin.-sec.*; Earl Ballard, *treas.*; Harvey Hill, Sr., *bus. rep.*; G. L. "Pappy" Luther, Clarence Holt, *exec. board*; L. C. Clark, Sam Hoffman, and Jasper Barron, *trustees.*

LOCAL 343, OMAHA, NEBR.

A. P. Fell, *pres.*; Ora Farnsworth, *1st vice-pres.*; Howard Crossland, *2nd vice-pres.*; Clyde Cooley, *sec.*; R. V. Mortenson, *fin.-sec.*; Ross Hatton, *treas.*; Howard Jackson, *bus. rep.*; Mace Brown, Paul Pollard, Charles Craig, *trustees*; Al Frazier, *sgt.-at-arms.*

LOCAL 384, HUDSON COUNTY, N. J.

Frank Mandrake, *pres.*; Albert De Titta, *vice-pres.*; John Cantoli, *fin. sec.-treas.*; Ira Dulberger, *rec.-sec.*; Ralph De Mea, *bus rep.*; Vincent Saponar, *sgt.-at-arms*; Arthur McMahon, Frank Maurus, Charles May, *exec. board*; Jack D'Agostino, Edward Dougherty, Vincent Saltamach, *trustees*; Thomas Neathery, Alfred Schwartz, Joseph Greulich, Joseph Cantoli, Sr., Charles Anguissola, *sen. comm.*

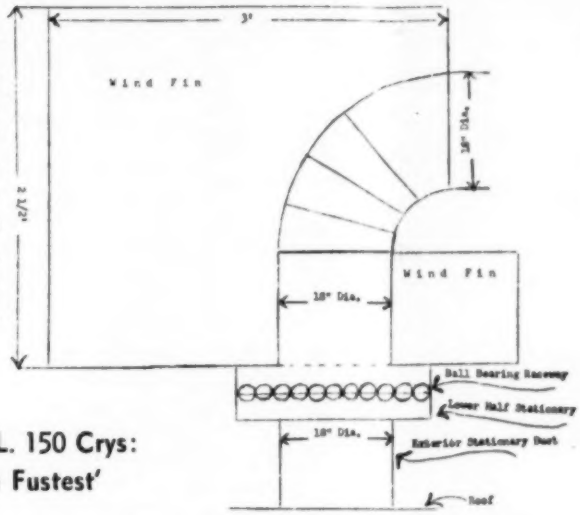
LOCAL 712, OWENSBORO-HENDERSON, KY.

William Drury, *pres.*; Norman Brown, *vice-pres.*; Earl Hardin, *sec.*; William Stewart, *treas.*; William Cart, *bus. rep.*; Smith Ezell, Norman Brown, R. J. Berry, *trustees*; Kenneth Chinn, *sgt.-at-arms.* William Cart was reelected to a third term as *sec.-treas. of the Owensboro Central Labor Union.*

RCA Service For 116 Schine Houses

A comprehensive service and parts contract covering the 116 theatres of the Schine Circuit, Inc., of Gloversville, N. Y., and RCA Service Co. has been signed. Under the new pact, scheduled sound equipment service, emergency service, and sound parts coverage will be furnished to all theatres in the chain, located in Delaware, Kentucky, Maryland, New York, and Ohio.

Projection Room Ventilation



Reproduction of a sketch accompanying the recommendations of Los Angeles projectionist Local 150 for an improved means of exhausting noxious gases from projection rooms. Details of the hookup are given in the accompanying article.

Los Angeles L. 150 Crys: 'We Were Fustest'

PUBLICATION in IP last month of the article "Carbon Arc Gases, Dust: Addendum" (p. 12) occasioned a flurry of comment from the projectionist craft, not all of which, it must be said candidly, agreed with the conclusions reached therein. However, there was an overwhelming majority of approval for the premise that the major responsibility for providing adequate projection room ventilation rested with the exhibitor, who, in turn, must be prodded by vigorous action by officials of the organized craft upon state and municipal authorities.

Particularly pertinent was the communication from IA Local 150, Los Angeles, Calif., which directed attention to its plan for adequate room ventilation which was presented for and won the approval of the California State Federation of Labor some years ago. A resume of this plan, with a sketch, is appended hereto:

The Labor Code of the State of California adequately provides for the number of cubic feet of air circulation in projection, rewind and generator rooms of moving picture theatres.

There is no provision in the State Code to insure that a back-draft does not occur thereby bringing the carbon monoxide back into the projection room, and,

It has been found that the prevailing wind, if of great enough velocity and blowing in the direction of the exterior arc lamp exhaust stack, forms an impasse for the exhausted gases creating a back-draft and bringing the fumes back into the projection room.

The installation of automatic funnels or hoods, at the extremities of the exterior arc lamp exhaust stacks will prevent the return of carbon gases to the projection room. These devices are similar to the funnels used on shipboard to ventilate between decks. The funnels are L-shaped and finned so that the prevailing wind may rotate them 360 degrees.

They should be mounted on ball-bearings to allow for ease in rotation: in this manner the funnel is turned away from the direction of the wind, making it impossible for a back-draft to occur. This is an inexpensive installation and would remedy the situation.

In drive-in theatres, in most instances, the exterior arc lamp exhaust stack, or duct, is too close to the projection room ventilation intake duct, with the result that the lamp-house-exhausted gases are being drawn back into the projection room. The exhaust stacks, or ducts, should extend not less than 25 feet away from the projection room intake duct and be equipped with automatic directional exhaust hoods.

Technicolor Expands Services

Technicolor has installed additional color developing and printing equipment so that it is now prepared to offer a wider variety of services, including a processing of single-strip color negatives such as Eastman color, Ansco color, and others.

Technicolor clients may now employ Technicolor's three-strip process, the Eastman, Ansco or other single-strip color negatives, have Technicolor develop the negative, and will be offered a free choice among the various processes, either in negative or positive.

Services offered include Technicolor's dye-transfer method, or the direct-positive type prints on Eastman, Ansco or other color stock.

Significant Savings Forecast

Thus, any saving made possible by the use of a single-strip color negative in a black-and-white camera is available to producers as part of the Technicolor process, whether the producer develops the negative or has Technicolor develop.

No matter which type of photography is employed, the producer may have his release prints filled with standard-dye transfer prints, which Technicolor feels excel in quality and in price, if his order is for the usual large number of prints required for feature-length films.

With its added machines and improved methods, Technicolor is able to serve producers, whether in flat screen, 3-D, Cinerama, or Cinemascope, with all of which Technicolor is working.

Big Drive-In Expansion Seen

Now that Spring is here, the drive-in theatre business is beginning to boom anew. This is expected to be an unusually big year because government restrictions on the use of building materials were lifted Jan. 1. The National Production Authority estimates that 1,000 to 3,000 new drive-ins will be in operation soon. There are already between 3,500 and 4,000 drive-ins.

The movies themselves are only a small portion of the drive-in's business and not only because the various refreshment and miscellaneous concessions can easily amount to 50% of the total receipts. The drive-in is operated as entertainment—*total* entertainment; while the movie is a feature attraction, it is by no means the only one.

The most flourishing market today for children's playground equipment is the drive-in. Swings, slides, merry-go-rounds, rides on miniature trains are standard equipment. Ezell Drive-Ins in Texas feature these playground facilities (free) in their advertising, plus free bottle warmers for baby while you enjoy your own meal, which is also obtainable at the theatre.

Catch-All Entertainment Package

What with bottle-warmers for the nipple trade, playgrounds for the older juveniles, dining facilities and even (in New Orleans) a special kiddy theatre where the small fry can sit in high chairs and watch 16-mm cartoons while mama and papa catch the main feature outside, the moviegoing pattern is nurtured with every modern convenience.

Some observers feel that the growth of 3-D movies and large-screen Tv, both of which pose difficult technical problems for the drive-in, might hinder the growth of the outdoor theatres this year; but another technical improvement may compensate. Using rear-view projection, some drive-ins will now be able to start their shows while fading daylight is still too bright for standard projection. This means that an extra show each night is possible, and this in turn means additional revenue.

SMPTE Screen Brightness Committee Report*

By W. W. LOZIER,
Committee Chairman

This report summarizes group progress to date and outlines some of our future plans.

1. SUBCOMMITTEE ON METERS AND METHODS OF MEASUREMENT: This group under the chairmanship of F. J. Kolb, Jr., has made a thorough study of the measurement of screen brightness and related factors. Specifications have been set up on the range of the variables which will need to be covered by various types of instruments. The report by this Subcommittee has been accepted by the full Committee and recommended for early publication in the SMPTE *Journal*.

2. SUBCOMMITTEE ON PROJECTION SCREENS: This group is engaged in the preparation of standards covering the brightness and whiteness characteristics of motion picture screens. The old War Standards of 1945 are being used as a basis of *departure*.

3. SUBCOMMITTEE ON ILLUMINATION PRACTICES: This is a new group recently set up for the purpose of establishing recommended practices concerning distribution of illumination on the motion picture screens.

THEATRE SURVEY OF SCREEN BRIGHTNESS: The Committee has completed a survey of screen brightness and related information in 125 indoor theatres widely distributed over the U. S. and in 18 West Coast studio review rooms used for 35-mm motion pictures. These data have been reported at the two 1951 meetings of the Society,[2,3] and have been published in the *Journal*. This survey has given us a good summary of screen illumination practices in a representative cross-section of the theatres in this country. This information is being used in our further activities looking toward improvement of theatre screen illumination.

The Committee hopes to survey a number of representative outdoor theatres during 1953 to obtain information on screen illumination practices in these installations.

REVISION OF SCREEN BRIGHTNESS STANDARD: The currently applicable American Standard on Screen Brightness, Z22.39-1944, has been modified[4] to include only indoor theatres and therefore exempts outdoor theatres from the provisions of this Standard. The revised standard has been recommended to the ASA for adoption as an American Standard.

PREFERRED CONDITIONS FOR VIEWING MOTION PICTURES: Our Committee has concerned itself with the fundamental problem of determination and exposition of the preferred conditions for viewing motion pictures. The Committee has encouraged discussion of the history and important factors having technical bearing on this problem. A summary of these matters was published last year in the *Journal* by one of our committee members.[5]

The Committee arranged and sponsored a Symposium on Screen Viewing Factors at the Spring, 1951 Convention of the Society. The papers presented at the symposium were published in the September, 1951 *Journal*[6] and contain much information pertinent to the determination of preferred viewing conditions. There are indications that our efforts are bearing fruit and that new interest has been stimulated in the experimental determination of some of these factors and further important revelations can be expected.

References

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2. W. W. Lozier, Chairman, "Report on Screen Brightness Committee Theater Survey," *Jour. SMPTE, 57:* 238-246, Sept. 1951.
3. W. W. Lozier, Chairman, "Further Report on Screen Brightness Committee Theater Survey," *Jour. SMPTE, 57:* 11-15, Nov. 1951.
4. "Revision of Screen Brightness Standard," *Jour. SMPTE, 58:* 452, May 1952.
5. F. J. Kolb, Jr., "The scientific basis for establishing brightness of motion picture screens," *Jour. SMPTE, 56:* 433-442, April 1951.
6. Symposium on Screen Viewing Factors (6 papers), *Jour. SMPTE, 57:* 185-237, Sept. 1951.

* Presented October 9, 1952, at the Society's Convention at Washington, D. C.

3-D Presentation Notes

By LESTER BARAGER
Secretary, IA Local 253, Rochester

First, I want to register a mild squawk: the order of business at our last regular meeting was hampered somewhat by the extended discussion by the members of the 3-D data which is appearing in IP. All to the good, however.

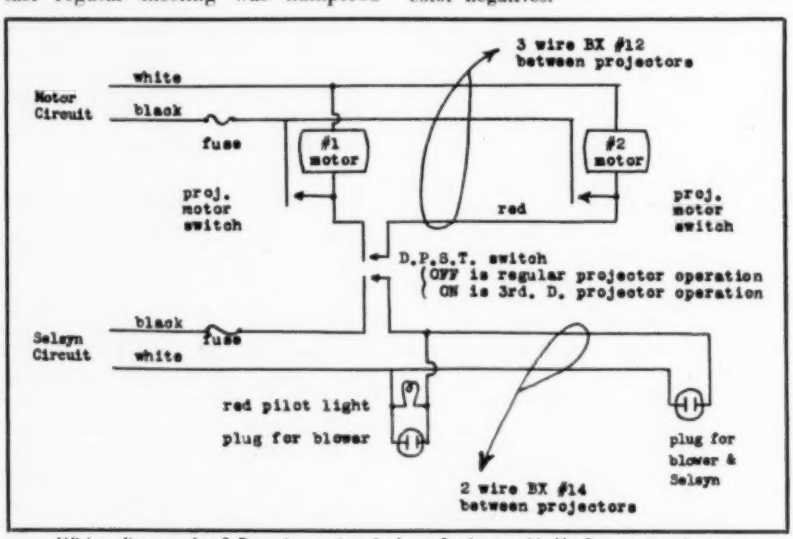
In order to install the large upper magazines for 3-D pictures at the Paramount, Rochester, it was necessary to cut out a section of the ceiling above the projectors, this projection room being suspended below the front of the balcony and having a slanting ceiling. Structural girders near the light beam prevented moving the projectors back.

Through the courtesy of Ira Epstein, city manager for Paramount, members of Local 253 were given the use of the Paramount theatre one morning for a demonstration of the 3-D equipment installed there for the showing of N-V's "Bwana Devil". Lester Barager, explained the equipment set-up, and then Louis Levin and Fred Boekhout projected the alignment test film and the first section of "Bwana Devil". Several more 3-D installations are slated for Rochester houses, and this demonstration prepared the men for their new duties and showed them the mistakes and pitfalls to avoid with this new media.

For the second week's run of "Bwana Devil", it was moved from the Paramount to the Regent theatre. Prior film commitments necessitated this switch. All of the 3-D equipment was moved over also, and it was dawn when the weary projectionists completed their trial screening.

Cinema Research 35-MM Color Dupes

Cinema Research Corp. announced in Hollywood that it is now producing both Eastman and Ansco duplicate 35-mm color negatives.



Wiring diagram for 3-D projector interlock at Rochester, N. Y., Paramount theatres.

National Carbon Co.'s Two New Improved Carbons

National Carbon Co. announces two new projector carbons. One is a regular high-intensity carbon for use in condenser-type, high-intensity lamps in the larger theatres which do not require the full maximum light of National "Hitex" carbons. The other is a new Suprex positive projector carbon, for use specifically in all mirror-type, variable-feed-ratio lamps.

The larger of the carbons is designated as the new 13.6-mm, 22-inch Regular H-I Positive carbon, designed for operation between 125 and 160 amperes to provide a much wider current range than previous carbons for similar service. Important advantages are: 15% or more longer life with equal light at the same current, a cooler light giving less heat at the aperture, and lower carbon cost per hour of operation.

The cooler light has considerable significance because it permits this carbon to be burned at 10 amperes higher current to give approximately 10% more light with no increase of heat at the film aperture.

Infra-Red Radiation Down

Due to the favorable alteration in the excitation and radiation processes taking place within the high-intensity crater, these changes are brought about by proper selection of materials and method of manufacturing. The visible light is emphasized at the expense of the infra-red radiation.

This improvement in high-intensity carbon operation is important to the projectionist because the increase in visible light is obtained without the use of heat filters and without the additional energy required at the arc to compensate for the losses in total energy characteristic of such heat filters.

The shipping case is identified by the letter "P" after the lot number on the end panel. Orders should be placed through distributor channels by Catalog No. L0115.

The other addition to the National Carbon line, designated as the 7-mm Suprex positive carbon, is rated at 42-50 amps, and is said to give more light than its predecessor at the same rate of carbon consumption. In addition, the new carbon is stated to be unequalled in uniformity and to operate with an arc stability far superior to any other 7-mm carbon, giving a brighter and whiter and cooler operating lamp. It is available in two sizes, 7mm x 12" and 7mm x 14".

This new carbon may be ordered through regular distributor channels by Order N. L0521 for the 7mm x 12" and L0525 for the 7mm x 14" size. The present 7mm "Suprex" carbon will continue in use for 1 Kw fixed ratio lamps.

Lens Showmanship

with SUPER SNAPLITE

...and "Showmanship" includes your plant equipment.
Super Snaplite f/1.9 Projection Lenses give *your* patrons maximum viewing satisfaction.

For Better Showmanship and Better Boxoffice use Super Snaplites. True speed of f/1.9 in all focal lengths up to 7 inches.

You get more Light with Super Snaplite

Ask for bulletin 207 and 209.

KOLLMORGEN Optical CORPORATION

Plant: Northampton, Massachusetts

NEW YORK OFFICE: 30 CHURCH ST., NEW YORK 7, N. Y.

Monthly Chat: Panoramic and 3-D Films

(*Continued from page 3*)

nurtured by the economic milk of the grass roots.

Cinerama is a marvelous technical achievement, but may God help us if the Grand Canyon crumbles and the canals of Venice run dry—this after an investment of $25,000 per theatre! Let's not forget that this system requires for its visual impact extensive construction work (shall we say *destructive?*) for stereophonic sound.

How many theatres in America today can find sufficient physical space to push their rear walls back 10% and extend their sidewalls 20%? Cinerama is a great show, if only we could afford it. And we haven't yet touched upon the matter of limited sight lines which, as we see it, confine wholly acceptable viewing to about 25% of the total seating of the average motion picture theatre in America.

We come now to the much publicized process of 20th Century-Fox—Cinemascope. This baby, in the taking process, compresses on the conventional 35-mm film frame a wide-angle image and then proceeds, by means of a "special projector optical attachment," to expand this image on a wide screen. This prospect is very entrancing, according to the eminent and much publicized Darryl Zanuck, production head of 20th Century-Fox, who has heretofore displayed both a minimum interest in and knowledge of the technical processes of the motion picture industry. Mr. Zanuck made the headlines in *Life* for March 9 last by scoffing, for an international audience (as he well knew) at 3-D pictures. Significantly, however, neither Mr. Zanuck, in his wisdom, nor any other responsible executive of 20th Century-Fox has deigned to give the *motion picture press* a single paragraph of technical data anent the Cinemascope process. We're only their customers.

Wide-Screen Optics Data

Well, IP will try to compensate for the innate shyness of these ivory-towered executives by stating a few facts.

Fact No. 1: The Cinemascope process is essentially a wide-angle lens deal. This is what IP thinks of any and all wide-angle lens systems:

In order to equal the screen width used by Cinerama by using one projector alone (Cinemascope-20th Century-Fox) a projection lens covering an angle of roughly 50° to 60° must be used. The amount of light projected on the screen is the amount of *light available at the aperture plate spread over the size of the screen.* Cinerama is using three projectors; but if one projector *only* be used, the amount of light received on a screen of *equal size* to the Cinerama screen will be approximately 30%.

Any attempt to increase the light by increasing the speed of the lens would be useless, since we are already using lenses which *fully* utilize the available light at the aperture plate. The problem, in a nutshell, is to use a lens with a covering angle of more than 50°, a speed approaching F:1.2 and a projector with the lamphouse system capable of filling this high-speed lens.

Such a system does not exist today, and it is so far removed from any normal system now in use, that we doubt that anybody as yet has approached the solution.

Illumination Sacrificed

Normal range of standard projection lenses have a speed of F:1.9, with maximum angle to approximately 16°. Tessar-and-Cooke-type lenses, which have angles of 45° to 50°, are made with speeds of about F:3 to F:3.5. As the covering angle increases, the speed decreases until we reach aerial photographic lenses which cover up to 150°, but at speeds of F:12 to F:20. The conclusion, therefore, is that it is possible to make a wide-angle lens *only* at the expense of illumination.

How much illumination can be regained by redesigning the lamphouse system and by increasing the speed of the lens at the expense of the *quality* of the picture, is anybody's guess. For instance, condenser lenses have speeds of F:1, but they are not fit for projection purposes. How far one would go in accepting deterioration of the image for the sake of more illumination is a question of choice.

It appears to us that the so-called wide-screen system using only one projector with a wide-angle lens will be only a poor imitation of the Cinerama system, using *three* projectors (light sources).

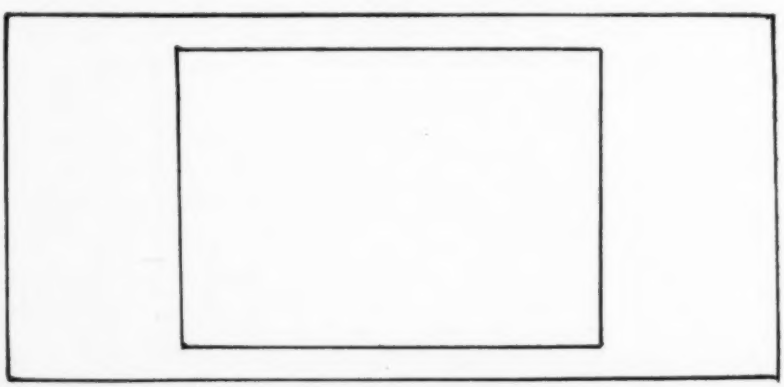
We may be wrong about this Cinemascope process; but if Mr. Zanuck and cohorts would display a greater affinity for their own motion picture trade press instead of staging a love duet with *Life* magazine, the exhibitors and projectionists who are wondering about the future of the business which has supplied Mr. Zanuck and company with such princely stipends through the years might be more appreciative of this "revolutionary" process.

Any time that 20th Century-Fox is willing to make a few sound-offs anent the various aspects of the Cinemascope process which are of prime interest to the exhibition field, our ears are flapping. Of particular interest to us will be data bearing on the means whereby 20th Century-Fox purposes increasing the projected light from 6 foot-Lamberts to a level approximating the 15 foot-Lamberts now regarded as the minimum reflected light level for projection screens. This story we want to hear.

3-D Process Less Risky

There now remains only to consider the current 3-D process which, while by no means new, serves to effect the *true* placement of things in space. There is no question but that 3-D provides intimacy supreme, the legitimate successor in cinematic form of the legitimate theatre.

Economically, this process involves no substantial investment by producers, equipment manufacturers, or exhibitors. Whether the paying patron will accept the enforced use of viewing spectacles is a question that only time can answer. But there is no question that this art-form, cinematically speaking, has and probably will continue for an indefinite period of time to pump red blood-cells in the form of box-office dollars into the somewhat



20th Century-Fox's Cinemascope process: an "anamorphic" lens squeezes the wide image (outer border) onto conventional 35-mm film (inner border) which, by use of a special projector-attached lens, expands the image to twice the size *in width* so as to offer a breadth of screen image represented by the elongated image shown above. In short, double double-talk via wide-angle optics.

anaemic exhibition branch of the industry.

Of course, 3-D films will also cost the exhibitor money, because for fulfillment of its dramatic impact it will require stereophonic sound, with its extensive equipment additions to and wiring alterations for existing theatres. Case in point is the work being done now at the Paramount Theatre (N. Y. City) for the forthcoming showing of Warners' 3-D "House of Wax." This job will probably run to more than $5000 for the stereophonic installation alone. That it will add to the dramatic impact of the film is unquestionable; but whether it will pay off in the long run is a question to which we hope some enlightened reader will give us the answer.

Setting down the foregoing observations has not been an altogether painless chore for IP, because it realizes that its two real friends of long standing — projectionists, with enhanced prospects for increased manpower, and equipment manufacturers who will find the rain of new equipment orders particularly beneficial after so many drought-ridden years particularly palatable—might be scared off the reservation.

While apologetic in this respect, IP can do no other in view of its outstanding record over the years for plain speaking: the facts have overtaken us.

RANDOM NOTES: Lest the theatre field get too cocky, IP *knows* that the Tv boys can at anytime they please (the FCC approving) bring *both* color and 3-D right into the home. This is another economic consideration for the downtown de-luxer as well as for the Rex Theatre on the corner.

Wide-screen presentations have *always* been a cinch for any smart projection man. Two such veterans—Harry Rubin, of United Paramount, and Allen G. Smith of National Theatre Supply Co.—are doing the job right now on Broadway, N. Y. By the simple expedient of filing the aperture plate, these boys are adding width to a regular "flat" release. Rubin, master of the Magnascope process for 25 years, is getting 10 feet extra width for the forthcoming Warner's 3-D "House of Wax," together with stereophonic sound emanating from *four* magnetic sound tracks. "Smitty" did the same thing at the Rialto Theatre.

Significantly, both these veterans spurned the Hollywood suggestion for a 2½ to 1 aspect ratio for the projected image in favor of the more sensible 2 to 1 ratio proposed by IP last month.

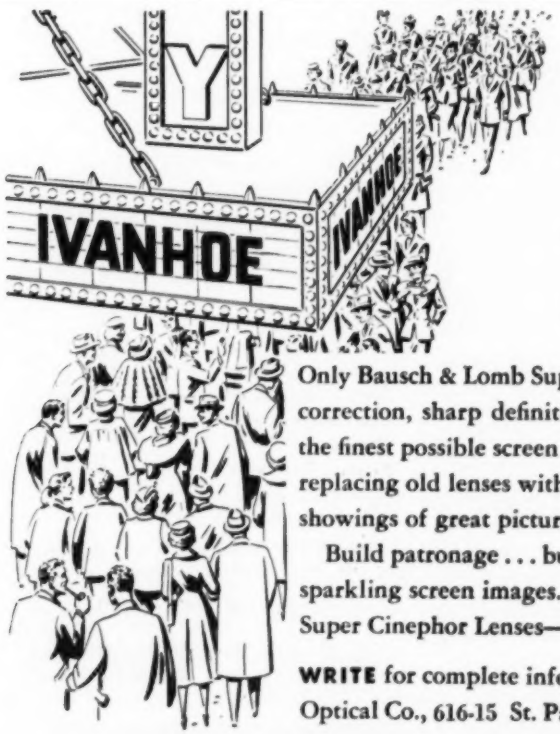
20th Century-Fox agents talk glibly about having 120 lenses ready for the impending Cinemascope showings, a phenomenal achievement when it is known that there have been made, to date, only two sample lenses by American manufacturers.

"Bwana Devil," which gave original impetus to 3-D, was of such story and production quality as to scare the wits out of Hollywood. Paramount was so steamed up at the possible unfavorable box-office reaction of "Bwana" as to precipitately stage a special N. Y. showing of *rushes* from its uncompleted top-budget feature "Sangaree." In terms of possible 100% production technique, IP rates "Bwana" at 25%, "Sangaree" at 60%, and the forthcoming "House of Wax" at 75%. "Wax" is a natural for 3-D.

As for the drive-in theatres, these guys are really in a tough spot. Already straining their ribs for more light, the advent of 3-D films will really put them on the spot.

IMPORTANT: 3-D spectacles are *positively not* suitable for use as sun glasses. Every theatre should go to extreme lengths to acquaint their patrons with this fact, even *via* the special screen trailer route.

—JAMES J. FINN



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Bausch & Lomb *Super Cinephor* Projection Lenses

AMERICAN LABOR MOVEMENT

(*Continued from page* 13)

tion of organizing activities, and general supervision over local union practices in admitting new members, collecting dues, and handling finances. Apprenticeship regulations, intraunion grievances or disputes, and strike action also fall within the scope of union administration.

The degree to which "headquarters" exercises control or supervision over these matters varies. Some unions are highly centralized with many policies determined and functions carried out by the parent national union. Other unions prefer to leave all except major policy matters to their locals. The extent to which collective bargaining is carried on at the national or local level often is a factor of importance in determining the degree of local union autonomy.

Normally the convention, composed of delegates representing the membership, is the highest policy-making body of the union. Of 208 national and international unions surveyed in 1949, 57 scheduled conventions annually and 72 biennially. Eighteen unions met every 3 years, 28 every 4 years, and 13 at 5-year intervals. A few unions determined their convention dates through referendum votes of their membership. Less than 10 made no specific provision for holding a convention.

Organizing the South

Membership drives are usually planned and supervised by the central offices of national unions, although they are of necessity carried out at local levels. Most unions launched intensive membership campaigns as wartime pressures subsided. In the spring of 1946, both the AFL and CIO renewed their organizing activity in the South, recognizing that so long as this great area remained relatively unorganized, the strength, if not the existence, of unions in other regions was threatened.

This was particularly true of the textile, apparel, and hosiery unions. In the words of Philip Murray, CIO president, "the South had to be organized in order to maintain a healthy national economy." Various unions reported, however, that employer opposition and difficulties in securing a favorable public opinion in the area retarded the recruitment of new union members and dampened the initial success of the drive in the South.

Educational facilities are provided by many unions. Certain craft unions, in particular, support trade schools to help members develop or improve their industrial skills. Other educational programs conducted as part of regular union meetings or in special classes of "institutes" have a more general purpose. Lectures, discussions and moving pictures are the methods of instruction commonly used.

Some union educational effort is specifically aimed at training officials in handling routine union problems. For example, unions frequently provide special instruction in accounting methods for local treasurers or in techniques of handling shop grievances for shop stewards. Classes are provided also for the study of parliamentary law, public speaking, and American Government and democracy.

Most unions publish newspapers or journals. These range in size from small leaflets designed solely to keep their members aware of the union's activities to full-size magazines with special departments and articles to help the members interpret vital national and international issues. These several hundred weekly and monthly publications are official organs of local and national unions as well as of the central CIO and AFL organizations. Unions publish also a wide variety of pamphlets and special reports in connection with their educational, political, and organizational programs.

[TO BE CONTINUED]

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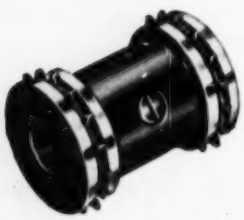

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75th Ann'y of the First Dynamic Loudspeaker

THE first patent on a dynamic loudspeaker was issued to C. H. Siemens on December 10, 1877, states *Audio Engineering*, Feb. 1953. It is British patent No. 4685, class 40-IV. It is interesting that this loudspeaker was developed long before there was an amplifier to operate it and before the days of the phonograph and radio. It was to be used in telephone equipment.

As shown in Fig. 1, two horseshoe magnets were used, one inside the other, to produce the magnetic field. One leg of the magnet was longer than the other and a hole was drilled in it slightly larger than the voice coil. A hollow pole piece was then placed inside the voice coil and extended to complete the circuit to the other leg of the magnet. The voice coil was wound on a form which was connected to the trumpet-shaped parchment cone.

The outer edge of the cone did not have the flexible corrugations used today, but because of the flatness at that point was fairly flexible.

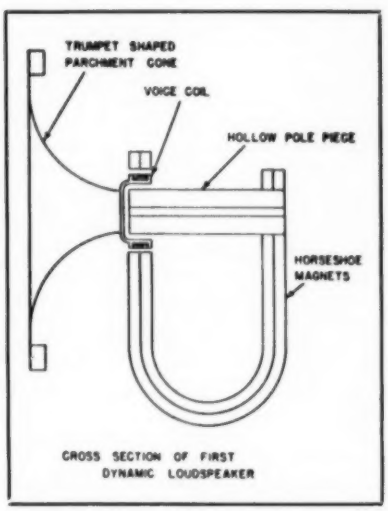

FIG. 1. The loudspeaker set-up which was covered by Siemens' 1877 patent.

Limited Degree of Change

It is surprising that modern loudspeakers have not changed very much. We have improved the magnet structure by using more powerful permanent magnetic materials and have added a more flexible rim suspension to lower the resonant frequency. The first design operated with an enclosed back with a compartment the diameter of the cone and extending back as far as the voice coil. Now we use a much larger acoustic enclosure.

As Chester W. Rice said to Edward W. Kellogg, during their development of the modern inertia-controlled loudspeaker nearly 50 years later (1925),[1] when they discovered that one of their ideas had been anticipated, "The ancients stole our invention."

1 Chester W. Rice and Edward W. Kellogg, "Notes on the development of a new type of hornless loudspeaker," *Jour. A.I.E.E.*, vol. 44, pp. 982-991; Sept. 1925. pp. 1015-1020.

East Coast (N. Y.) Video City Planned

Construction will begin soon on a giant new East Coast Television City at the old World's Fair site in Flushing Meadows, Queens, N. Y. When completed, studio facilities will be available to video networks and motion picture companies on a rental basis. The land is owned by the City of New York, but the building and equipment will be the property of a private corporation.

3½ Million/sec. High-Speed Camera

A new ultra-fast camera developed by the University of California's Los Alamos Scientific Laboratory operates at speeds up to 3½ million frames a second. The camera is a continuous-writing, mirror type and is useful primarily for recording high-speed events that are self-luminous or illuminated by very intense explosive light sources.

NEMA Catalog of Science Films

National Electrical Manufacturers Association has a 56-page, 1952 catalog listing "16-mm Films of Electrical Significance." A total of 409 16-mm films is listed, all specially selected "for their educational value in the electrical field." The catalog gives complete information, so far as available, as to type of print, color or black-and-white, sound or silent, producers and distributors, sales or rental rates, release dates, running time, educational level, and a brief description of the treatment. For example, page 25 of the catalog lists How Motion Pictures Move and Talk, coded as suitable for all levels from junior high school up through college and adult education, running 11 minutes, sound, black-on-white, sold at $45.00 and rented at $3.00.

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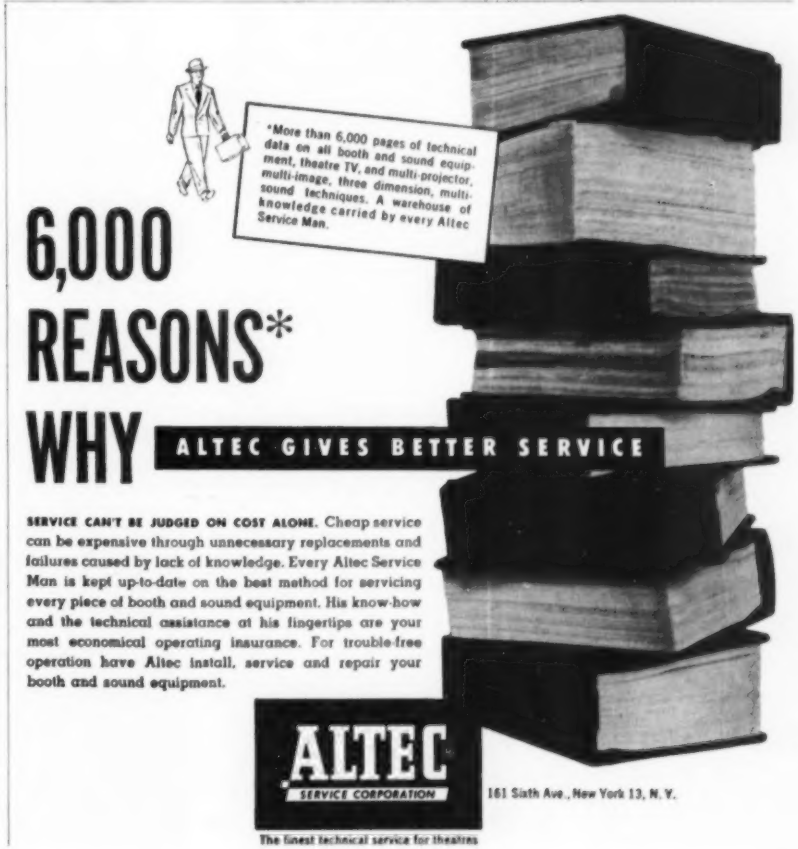
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Home Tv Splurge Unabated

Year-end (Dec. 1952) statements by RCA top executives included much data of interest to those in competitive entertainment fields. For example: during 1952 more than 6 million Tv receivers were produced; Tv homes increased from 15 to nearly 21 million; 117 Tv stations were on the air by mid-December, and construction permits had been granted to 135 others.

It is expected that more than 150 additional stations will go on the air during 1953, adding another 5 million families to the Tv service range. Currently 47% of the families in the U. S. have Tv sets, and over 65% of the population is within range of one or more Tv stations. Further progress has been made with the compatible color Tv system, and 3-D color Tv is expected to be perfected during 1953.

Add to Nation-Wide Relay Network

During December last, three links were added to the nation-wide radio relay network, providing expanded facilities for telephone message and Tv service. An additional westbound channel has been placed in service between Chicago and the West Coast on the trans-continental route. This channel parallels existing radio relay facilities, which are routed to the Coast by way of Omaha and Salt Lake City.

On the Pacific Coast, two additional channels have been opened, one northbound and one southbound between Los Angeles and the San Francisco area. The northbound channel originates at Los Angeles and it is routed to San Francisco via Oakland. The southbound channel connects Oakland with Los Angeles. Both of these channels are joined to the transcontinental group opened by the Bell System on August 17, 1951.

A microwave installation making network Tv service available to York, Penna., has been placed in operation. Network service has also been made available to Atlantic City, N. J., by radio relay out of Philadelphia. With the addition of these two facilities, network programs are now available to 114 television stations in 71 cities.

U. S.-Canada in Aluminum Trade

At the request of the U. S. Government, the British Govt. and the Aluminum Co. of Canada have agreed to an arrangement which will supply this country with an additional 44 million pounds of aluminum for delivery during February and March, 1953. If Britain desires, U. S. producers will repay the tonnage during 1954-55.

New Cincinnati Supply House

Theatre Equipment Co., of Toledo, Ohio, has opened a branch office under the same name in Cincinnati at 1714 Logan St. It will be managed by Orville C. Wells, who has had many years of experience in the equipment field by reason of extensive work in sound engineering and drive-in theatre construction. He was formerly associated with National Theatre Supply and later with United Theatre Supply, of Miami.

All nationally known supplies will be stocked at Cincinnati, including Strong lamps and rectifiers, Century projectors, National carbons, Eprad speakers, and 3-D projection equipment.

OBITUARIES

Milton H. Bell, 51, and Oliver T. Grimes, 49 both members of Local 287, Beaver Falls, Penna., died within 24 hours of each other. Milton Bell joined the Local back in 1926 and worked with the regular projection crew at the Granada Theatre from the day the theatre opened in 1929 until 1950, when illness forced him to retire. Oliver Grimes, a member of the Local since 1944, took over at the Granada upon Bell's retirement and held the job until he succumbed to a heart attack on New Year's eve.

Berry Vann Brock, vice-president of Local 413, Gadsden, Ala., died suddenly last month at the age of 55. He joined the Local in 1920 and at the time of his death had been employed as projectionist at the Princess Theatre.

Philadelphia Local 306 lost two of its long-time members in the recent deaths of Sol Borman and Morris Korf. Sol Borman, who died at the age of 56, held membership in the Local for the past 30 years and had been in ill health for some time prior to his demise. Morris Korf was 72 at the time of his death and was a member of 307 for 34 years. He, too, had been ailing for quite some time.

George L. Howard and John E. Lyons, members of Local 650, Westchester County, N. Y., died last month. Howard passed away on February 9, and Lyons on the 22nd.

Joe Brewer, member of Local 249, Dallas, Texas for the past 40 years died recently. Brewer was a former official of the Local, having held various offices.

Jacob Edwards, 64, member of Detroit Local 199, succumbed to a heart attack in the projection room of the Michigan Theatre.

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TYPES OF THEATRE SOUND REPRODUCERS

(*Continued from page 8*)

gear is driven by a pinion attached through a flexible coupling to the motor shaft.

Combination Visual-Sound Unit

The writer has long been an advocate of *combined* projection and soundroproducer units. It has seemed to him unnecessary to use "silent" picture mechanisms mounted upon separate sound-heads, when the sound reproducer could easily be incorporated into the design of the picture mechanism. Actual operating experience on a combination picture-and-sound mechanism of American manufacture, however, has proved to him that such combination mechanisms will never be popular with American projectionists until the manufacturers of these machines come to realize that *operating ease* means a great deal to the fellows who have to operate such equipment daily, year in and year out.

Sound reproducer units so diminutive that they cannot be threaded with ease will never gain widespread craft acceptance. While the writer still believes that picture and sound mechanisms ought to be combined into a single unit, he reluctantly admits that he is not too favorably impressed by efforts made in this direction up to now.

Soundhead Optical Components

Standard soundhead optical units contain three elements: a slit, a condenser lens for focusing the exciting-lamp filament on the slit, and an objective lens which focuses a reduced image of the slit on the soundtrack.

The slit-image is a line of light 0.084 inch long and, formerly, only 0.001 inch in width. The narrower the slit-image, the higher the cutoff frequency, and hence (it would seem) the more efficient it will be for reproducing the sound recorded in the soundtrack. It has been found, however, that better results are obtained with a slit-image 0.00125 inch wide. The wider slit lets through 25% more light from the exciting lamp, thus increasing photocell output by the same amount. This enables the projectionist to use a lower volume-control setting to obtain the same loudness of sound, but with less surface noise.

Since the cutoff frequency of the 0.00125-inch (1¼-mil) slit is well above the highest response of the sound system (between 8,000 and 9,000 cps), use of the wider slit results in an attenuation of the higher frequencies too slight to matter.

The cutoff frequency for a slit-image is the lowest one which produces no change in the intensity of the scanning beam when a recording of tnat particular frequency passes through the slit-image. This occurs when one complete cycle of sound ("double vibration") as photographed in the soundtrack exactly fills the scanning beam. Assuming a standard 35-mm film speed of 18 inches per second, the cut-off frequency is 18,000 cps for a 1-mil slit-image; 14,000 cps for a 1¼-mil slit-image.

Establishing Correct Focus

When an optical tube is correctly focused, the variations of light and dark in the soundtrack cause the scanning beam to flicker uniformly on the cathode plate of the photoelectric cell. In fact, the "flicker test" may be used for focusing soundhead optics. A test film having a 7,000- or 9,000-cps track should be threaded in the soundhead, with the exciting lamp turned on, and the projector turned *very slowly* by means of the handwheel.

Then observe the light falling on the

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photocell cathode—the light-sensitive plate of the cell—to find out whether or not the scanning beam is being correctly modulated, the light flickering uniformly without any shadow-bands moving up or down. If the photocell cathode is difficult to see (it is brownish in color), the cell may be taken out and a white card of the proper size used in its place as a screen.

Now, if shadow-bands that move upward are seen as the film is slowly pulled downward, the optical barrel is a trifle too close to the film. The barrel should be moved toward the exciting lamp, away from the film. If, on the other hand, shadow-bands that move downward, in the same direction as the film, are observed, then the optical unit is too far away from the film. It should then be moved away from the exciter, toward the film.

Sound service engineers sometimes use this flicker test for adjusting the optical unit; but more often they attach an A.C. milliammeter ("output meter") to the amplifier and move the unit back and forth until the needle of the meter shows that the greatest output is being obtained while a high-frequency test film (usually in the form of a continuous loop) is run at normal film speed. Due to peculiarities in the design of certain optical tubes, several "peaks" are obtained on either side of the middle, and greatest, peak indicating maximum output. The engineer guards against setting the unit at one of the minor peaks.

P. E. Cell Sensitivity

It is truly amazing how little light is required to excite p. e. cell. When a 50-watt (5-ampere, 10-volt) exciting lamp is used, the amount of light which passes through the film to the photocell cathode averages only about ½ lumen. To demonstrate the sensitivity of the photocells in your sound equipment, turn on the system, remove the cover from the photocell in one of the soundheads, and shine a flashlight on the cell. A ringing sound will be heard whenever the flashlight is tapped, this being caused by vibration of the flashlight-bulb filament.

This simple demonstration also serves to remind us that good sound cannot be obtained if the exciting lamps are not properly and solidly mounted, or have sagging filaments, or are blackened by age. Old and defective exciters should be replaced before they burn out. When replacing exciting lamps, take care to adjust the sockets so that the maximum amount of light is obtained on the photocell cathodes.

[TO BE CONTINUED]

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Automatic Digit Recognizer

An electronic device that can understand and intelligently react to spoken numbers has been built at Bell Telephone Laboratories. Named "Audrey," a contraction of "automatic digit recognizer," it is a special circuit that can automatically determine which of ten numbers, from 1 through 0, has been spoken into a telephone.

In its present form, the device responds by flashing an appropriate light, but it may equally well control other operations, such as dialing mechanisms. Ultimately it is hoped to extend the device's vocabulary to include additional sounds—words other than numbers—and it is expected that the device may even be taught to say some words on command.

'Memory' and Matching

The newly constructed recognizer operates on a principle of memory and matching. It listens to the human voice, then sorts the speech sounds into electrical categories that conform in their own medium to sound-wave patterns. These categories are analyzed by matching against a memory cell containing standard reference patterns already set up electronically. When the standard pattern is found which best matches the electrical pattern of the spoken number, the appropriate light flashes on.

When the device is adjusted for best performance with a particular speaker, it operates with high accuracy, but it is not yet in a state to answer reliably to a wide variety of talkers unless it is readjusted for each one. It will not tolerate careless enunciations or accents.—BELL LABORATORIES RECORD.

New ASA Still Camera Shutters

Four new American Standards covering still camera shutters provide users with better knowledge of what to expect from their shutters in the way of exposure time. Recently approved by the American Standards Assoc., the new standards are aimed primarily at improving the uniformity of shutter speed markings and exposure time performance. They define a minimum number of terms, specify test procedures acceptable for measuring basic quantities, and establish performance tolerances.

The four quantities defined in the standards are: Total Open Time, Efficiency, Effective Exposure Time, and, in the case of between-the-lens shutters, their Maximum Opening.

Two of the standards give exposure-time markings for between-the-lens shutters and for focal-plane shutters and select scales with which shutters should be marked. Test procedures capable of measuring the quantities defined, under controlled laboratory conditions, are covered in the other two standards.

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